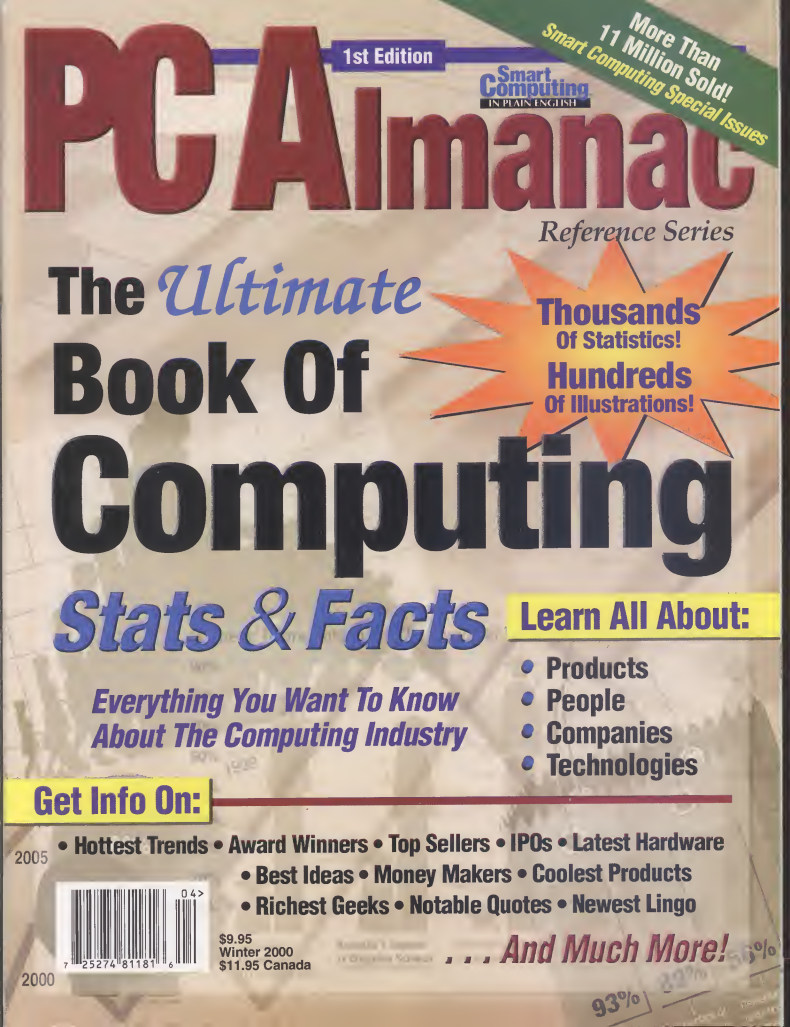
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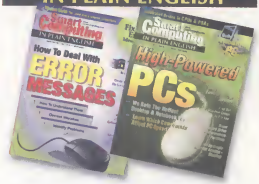

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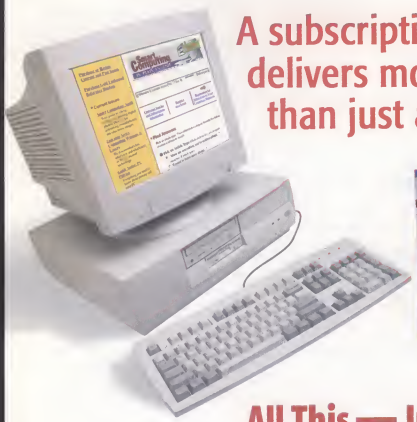

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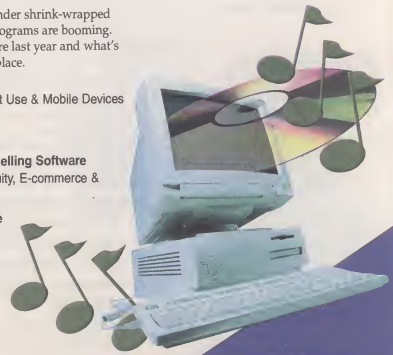

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It's A Wired, Wired World

A Look At Internet Trends

In the span of less than a decade, the Internet has gone from an obscure technological toy for computer geeks to a fixture of modern life. Today, millions of people worldwide work, play, and learn differently than they did just a few years ago thanks to the Internet. The modern computer has begun to change the way we buy just about everything, including CDs and houses. It's rare to see an advertisement or product packaging that doesn't include a **URL** (**universal resource locator**, an Internet address). In addition, it has changed the way we communicate. Anymore, it is rare to see business cards without e-mail addresses on them.

It is important to understand that the growth and changes that have taken place within the framework of this worldwide network of computers haven't just been happy coincidences. To the contrary, like most human invention, the Internet has evolved and grown largely according to the wants and needs of those who use it. And, like most worldwide phenomena, the Internet has spawned a number of social side effects that bear watching. In this section, we'll look at both with the help of some hard numbers and commentary from industry experts.

■ **The (Other) Great American Pastime.** The most remarkable thing about the Internet is how important it has become to us. According to Internet research and measurement firm Media Metrix, in a report involving 55,000 Americans, average Web use has increased nearly four hours per month (from about 12.5 hours in June 1999 to nearly 16.5 hours in June 2000) in the last year alone. America Online's 1999 Cyberstudy, conducted by Roper Starch Worldwide, found 38% of a random sample of 1,000 Internet users felt the Internet was "nearly a necessity" in their lives. Two-thirds of the respondents, 66%, indicated they would rather have a computer connected to the Internet than a telephone or a television if they were stranded on a desert island.

Increasing Internet use in the workplace explains overall increases in use somewhat. Nielsen/NetRatings reported in August 2000 that, on average, people who use the Internet at work spend more than twice as much time online at work as they do at home. But there is more to the usage explosion than necessity. Lee Rainie, the director of the Pew Internet & American Life Project, a nonprofit initiative to study the effects of the Internet on modern life, says an increasing number of people are discovering how much fun the Web can be. "The newcomer to the Internet now tends to be someone who is getting online from home [and] who is pretty interested in the fun side of the Internet. They're doing instant messaging, browsing for fun, and playing a lot of games," Rainie says. He says women, the fastest growing group on the Web, have adopted the Internet in a large part because it connects them with their families and friends in a powerful way.

> **They Said It...**
>
> *"It's not Big Brother that we now have to be afraid of, but Big Browser."*
>
> *-Eliot Spitzer, New York state attorney general, New York Law Journal, Jan.24, 2000.*

■ **Cyber Addiction.** According to some research, however, not everyone uses the Internet to enhance his or her social life. One issue surrounding the increasing popularity of the Internet is whether people are spending too much time online and neglecting other areas of their lives. In February 2000, Stanford University's Institute for the Quantitative Study of Society (SIQSS) released the "Internet and Society" report, which outlined a number of trends in Internet usage. The study found that people who use the Internet between five and 10 hours per week spend significantly less time interacting socially. Of more than 4,000 respondents, 5% reported spending less time attending events outside their homes. Ten percent of the respondents reported spending less time with family and friends, and 26% reported spending less time talking to family and friends over the phone.

Findings such as these and others on the subject have led some researchers to classify addiction to the Internet as a clinical disorder. Dr. Kimberly S. Young, founder of the Center For On-Line Addiction, found significant signs of addiction among test subjects in 1996. Young used an adapted set of criteria based on the symptoms of people with pathological gambling disorders to gauge subjects' dependence on the Internet for her "Internet Addiction: The Emergence Of A New Clinical Disorder" paper. Young found that not only are there considerable differences in the amount of time people spend online but also that people she classified as "Internet dependent" spent their time on different activities than "nondependents." Thirty percent of nondependent users primarily used the Internet for e-mail; only 13% of dependent users listed e-mail as their most common online activity. Conversely, only 7% of nondependents spent most of their online time in chat rooms; 35% of dependent users listed chat rooms as their most common activity.

■ **Dialing Up For Dollars.** It seems likely that money is the single largest factor in influencing and speeding the growth of the Internet. The Internet's transformation from a small collection of networked university and government research mainframes to the newest mass media is due in part to entrepreneurs recognizing its potential as a marketing resource. The effect big business has had on the Internet is similar in nature to the profound impact commercial advertising had on radio programming about 80 years ago. Thanks to money from paid sponsorships, the amount and breadth of radio programming increased considerably. And thanks to modern Web advertising and commercial Web sites, the amount of information available online grows daily. The relatively low cost of selling

Do You Know...

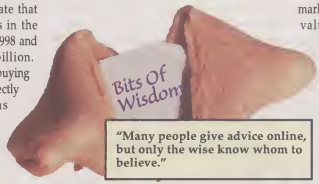
how the Internet began?

In 1969, the United States Department of Defense started a project called ARPANet (Advanced Research Projects Agency Network) to exchange research information. It eventually linked the computers of several universities and research centers across the country, and, over time, it developed into the worldwide Internet as we know it today.

or advertising over the Web (compared to traditional methods) combined with the immediacy and constant access it provides makes it perfect for small-business owners and corporations alike.

Although estimates vary from source to source, it is clear that companies are increasingly willing to spend plenty of cash to buy advertising space on sites around the Web. Research firm IDC's numbers indicate that total Internet advertising revenues in the United States reached $1.2 billion in 1998 and nearly doubled in 1999 to $2 billion. As impressive as these numbers are, buying and selling products and services directly over the Web, which is known as **e-commerce** (**electronic commerce**), is even bigger. According to the United States Department of Commerce, online retail sales in the United States alone reached $5.198 billion by the fourth quarter of the 1999 calendar year. E-commerce revenues continued to grow steadily, totaling $5.24 billion and growing .07% as of the first quarter of 2000 despite an 8.9% decrease in overall retail (traditional and online combined). During the second quarter of 2000, online retail accounted for $5.518 billion in sales, and experts expect those numbers to continue to grow. In fact, many analysts, such as Anne Rickert of Media Metrix, think e-commerce is just getting started. "We're seeing continued movement beyond the early-adopter categories like books, music, and videos to multithousand dollar purchases like cars, jewelry, and luxury goods," Rickert says. "There's a lot more confidence now, and people will step up and spend thousands of dollars and make a major purchase online."

In addition to consumers shopping at sites such as Amazon.com, a growing number of businesses are doing business with each other online. B2B (business-to-business) e-commerce has really taken off lately. Although B2B sites are working with smaller numbers of visitors than consumer sites to begin with, they are expanding at a faster rate. In September 2000, the Boston Consulting Group reported that B2B e-commerce in the United States will jump from transactions valued at $1.2 trillion in 2000 to $4.8 trillion in 2004. The report also indicated that B2B online purchases will represent a staggering 40% of all business procurement by 2004, despite the fact that only 11% of these transactions will involve online price negotiations.



"Many people give advice online, but only the wise know whom to believe."

■ **The New Economy.** All the money generated by Internet commerce and advertising (and certainly all the money spent making it work) has had a profound effect on the world economy in general and the United States economy in particular. In June 2000, the University of Texas at Austin's Center for Research in Electronic Commerce released a report indicating there were 2.476 million Internet-related jobs in the United States in 1999. This makes the Internet industry a bigger employer than the federal government (not counting postal workers), communications, public utilities, or the insurance industry. Internet jobs increased by 36% in 1999, and Internet revenues totaled more than half a trillion dollars ($523.9 billion).

As a result, the Internet has thrust itself into public awareness in a big way. Blue chip stocks are still the cornerstones of markets around the globe, but the hot topic of conversation lately is how tech stocks are doing, and more specifically how dot coms are doing. The term **dot com**, of course, is from the ".com" at the end of Internet addresses and refers to Internet companies. Dot-com stocks went through a period of amazing growth throughout most of 1999, and despite warnings from market experts that many were highly overvalued, they were all the rage among investors. Venture capital companies threw enormous stacks of cash at new dot coms. The dot coms in turn lured managers, lawyers, accountants, and technicians away from major firms across the country by offering extravagant salaries, stock options, and in some cases BMWs as signing bonuses.

The party began to wind down a bit early this year, however, when Wall Street began to sour on dot coms with huge stock values and poor financial performance. By April 2000 a market "correction" had pushed the stock values of many dot coms down, some by more than 90%. This devaluing of dot-com stocks and the huge amounts of cash most were spending to build their customer bases forced many companies to seek further funding. But venture capital firms had become much choosier about which companies to fund, and companies that had been swimming in cash found it hard to meet payrolls and business expenses. Many filed for bankruptcy protection or were bought up by

Quick Tips

A Web site will often ask you to input your e-mail address while registering for access to the site. Read the Web site's disclaimer to understand how that site will use your e-mail address. In addition, sites often include a Please Send Me More Information checkbox that is checked by default, so make sure to uncheck that box if you don't want to receive such mailings.

"Online shopping pro: You'll probably pay no sales tax. Online shopping con: Your credit card fees will more than make up for it."

other companies.

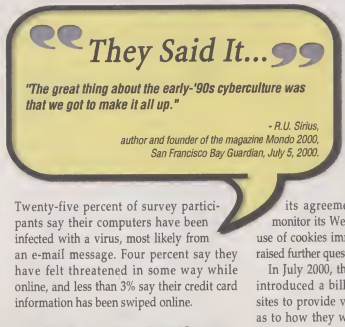
Despite all the doom and gloom surrounding Internet stocks, though, they are still a hot topic, and some investors find them even more attractive now than before thanks to their bargain-basement prices.

■ **Legal Concerns.com.** The Internet companies with billions of dollars created a completely new firestorm of controversy over Internet taxation. There are a number of difficulties with taxing Internet transactions, such as which state's tax codes transactions are subject to and which taxes apply. Supporters of Internet taxation hold that e-commerce is like any other form of commerce and should be taxed accordingly; opponents claim the complexity of the issue could stifle the growth of the industry. Congress' ITFA (Internet Tax Freedom Act) of 1998 put the debate on hold by freezing new Internet taxation for three years. It called for a group of congressional appointees called the Advisory Commission on Electronic Commerce to draft reasonable recommendations on how to tax Internet commerce at local, state, national, and international levels. In April 2000, the Commission submitted its report to Congress and the debate began in earnest, with the ITFA expiring in October 2001.

The government and the private sector are also trying to figure out what to do about Internet privacy and security. Hackers made the news several times in the past year or so, and, on a few occasions, gained access to privileged information companies keep about their customers, including bank account and credit card information. These problems combined with computer viruses that spread through the Internet via e-mail and downloaded files have people worried.

The Pew Internet & American Life Project surveyed 2,117 Americans (including 1,017 Internet users) between May 21, 2000 and June 21, 2000 about trust and privacy online. The results showed why some people haven't gotten online yet and why many Internet users still don't shop or disclose any sensitive personal information online. Of the respondents, 84% indicated they were concerned about businesses and strangers obtaining personal information without their knowledge. Sixty-eight percent said they were concerned about hackers getting their credit card numbers, and 54% responded that they were concerned about getting computer viruses from downloaded files.

Rainie says the interesting thing is the number of people who reported these things happening to them was actually quite small. "There aren't a lot of horrible things online despite the headlines about hackers getting credit card information or invading Web sites," he says. "The incidence of really gross things happening online is very small."


They Said It...
"The great thing about the early-'90s cyberculture was that we got to make it all up."
- R.U. Sirius,
author and founder of the magazine Mondo 2000,
San Francisco Bay Guardian, July 5, 2000.

Twenty-five percent of survey participants say their computers have been infected with a virus, most likely from an e-mail message. Four percent say they have felt threatened in some way while online, and less than 3% say their credit card information has been swiped online.

■ **Whom Do You Trust?** Despite these seemingly mild statistics, people still want to be sure sites they visit and do business with keep their personal and financial data confidential. That's why there has been such uproar about Web sites collecting and selling personal information. The Pew Internet & American Life Project's study "Trust and Privacy Online: Why Americans Want to Rewrite the Rules" indicates 54% of Internet users believe Web sites tracking users is harmful because it invades their privacy. Just 27% of users feel tracking is helpful because it lets sites provide information tailored to specific customers. Tracking and profiling Web surfers has become big business, and, in many cases, Web surfers aren't aware companies are watching where they go and what they do online. Sites can attach small files called **cookies** to your Web browser. They identify you each time you visit, and, in some cases, they may store other information about your Web-surfing habits. Most Web sites have self-imposed privacy policies that govern how they collect and use such information, but, until recently, making sites accountable for breeches of privacy policies has been difficult.

TRUSTe is a company that helps other companies develop privacy policies for their sites and gives sites that demonstrate a willingness to respect consumer privacy its seal of approval. The program has been a success in the sense that sites have been responsive; Media Metrix estimates that 88% of Web users will visit a site with the TRUSTe seal. The problem is the TRUSTe program relies heavily on the honor system, and, in some cases, sites may violate basic privacy policies without even knowing it. In August 2000, Interhack, a Web security consulting company, discovered TRUSTe was using cookies to track visitor information at its own site. TRUSTe stated the tracking was an unintended by-product of its agreement with Internet.com to monitor its Web site traffic and halted the use of cookies immediately, but the incident raised further questions about Web privacy.

In July 2000, three United States senators introduced a bill that would require Web sites to provide visitors with full disclosure as to how they will use customer information. The bill would also give the FTC (Federal Trade Commission) the authority to bring civil suits against sites that violate their own privacy policies and levy civil penalties of $22,000 to $500,000 per violation. Under present provisions, the FTC can penalize

companies that violate privacy policies, but only after issuing orders to offending sites to change their ways. If companies ignore the FTC's initial order, the Commission can take civil action.

The Love Bug. Although the threat to most consumers accessing the Internet through personal computers at home is relatively small, the cost of dealing with hackers and viruses is considerable for businesses. Survey results from PricewaterhouseCoopers, which were published in July 2000, indicate viruses and hackers will cost United States businesses $266 billion this year, with the worldwide bill coming to $1.6 trillion. The survey of IT (information technology) professionals also suggested IT troubleshooters will spend the equivalent of nearly 40,000 years of productivity (where each year represents one person working 24 hours per day, 365 days per year) dealing with security-related problems in 2000.

One virus in particular, called the Love Bug because of the "I love you" message in the subject line of an infected message, wreaked havoc on businesses across the country. On May 5, 2000, many Americans woke up to find e-mail in their inboxes containing curious attachments with the file extension .VBS. This extension signifies its file contains Visual Basic scripts. Visual Basic is a programming language used to create Windows applications, but many people didn't know this. In addition, many ignored conventional e-mail wisdom that says to never open e-mail attachments from strangers and opened the file to find out more about the supposed senders' amorous intentions. Within just a few days, the Love Bug infected some 600,000 computers in the United States and caused an estimated $2.5 billion in damage, according to Angus Reid Group and Symantec research.

The Bug hit businesses hardest because it used information in each victim's Microsoft Outlook address book to send itself to many other people, each of whom received a message from someone they knew and/or worked with. Soon mail servers at affected companies had thousands of messages flying from all the users on their networks to all the people in their address books. Many of them couldn't handle the strain and crashed, leaving businesses without e-mail, which has perhaps become the most vital by-product of the Internet in terms of productivity.

Just the Facts!

On average, 55 million Americans connect to the Internet every day and 48 million read or send e-mail messages. (Source: Pew Internet & American Life Project, May 10, 2000)

They Said It...

"Without Internet advertising, there is no Internet."

-Kevin O'Connor, DoubleClick CEO, Reuters, Feb. 29, 2000.

The Digital Divide. One of the biggest issues surrounding the Internet in the past year has been the idea that there is a widening gap between those with access to computers and the Internet and those without. Some industry observers discuss this digital divide in terms of computer and Internet access as North America and Western Europe vs. the rest of the world. Others see it as a chasm between ethnic groups. In June 2000, Jupiter Communications released the "Assessing the Digital Divide(s)" report. It stated that the largest digital divide runs between households with varying incomes. It indicates that although one-fifth (19%) of U.S. households have annual household incomes of $15,000 or less, and only 3 million such households will have Internet access by the end of 2000. By comparison, 15 million households with incomes of $75,000 or more will be online by the end of the year.

The good news is this gap may be closing. Media Metrix reported in August 2000 that while they still make up the smallest segment of Internet users, households with incomes of less than $25,000 are the fastest growing group online. Rainie says that falling computer prices and a wider variety of online content are making the Internet population in general more closely reflect the American population. "At the dawn of the Web, the population was dominated by young white men with high levels of education and relatively high incomes," he says. "Now there's parity between the sexes online, a lot more minorities, and a lot more people coming online that don't have high levels of education."

Digital Dawn. Looking forward, experts such as Rainie expect the Internet will eventually be as popular as telephones and televisions, but this probably won't happen overnight. "You're not going to see that kind of penetration for another generation is my guess," he says. Research indicates there are still a large number of people that didn't grow up with technology and aren't comfortable with it or don't feel the need to have it in their lives. But as children who grew up with computers reach adulthood, and as technologies such as broadband access become better and cheaper, it will become an even larger part of our lives. RS

by Chris Trumble

Internet Trends

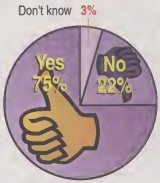
When it comes to predicting the future of the Internet, no one has a crystal ball, but with the help of market research gurus and statistics, we can make some educated guesses. We compiled some numbers on the most popular sites and on how people are getting online to illustrate the latest usage trends. We also threw in figures that shed some light on the unpleasant aspects, such as viruses and cybercrime, of the booming new economy.

An Essential Element

We hear a great deal of hype about how important the Web is becoming, but how much of it should we believe? If research published by AOL and Roper Starch Worldwide last year is any indication, the Web is becoming a vital part of everyday life. Roper surveyed a random sample of 1,000 Internet/online service subscribers who were 18 years old and older, and asked them the following questions.

Which of three technological devices would you rather have if you were stranded on a desert island?

Is the Internet making your life better?

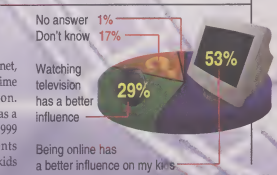


Is the Internet "nearly a necessity" in your life?

Source: AOL and Roper Starch Worldwide, 1999

You Are What You Surf

With the increasing popularity of the Internet, many kids are choosing to spend their time online instead of in front of the television. However, the public seems to see the Internet as a more positive influence than television. A 1999 AOL/Roper study found that most parents believe using the Internet is better for their kids than watching television.



Source: AOL and Roper Starch Worldwide, 1999

Online Time

According to Internet research firm Media Metrix, people are definitely spending more time online in 2000 than they did a year ago. The results of a recent survey of about 55,000 U.S. Internet users shows that, on average, each person spent more than 200 minutes more online during June 2000 than he or she did in June 1999.

Month	Online Minutes Per User
June 1999	755.8
July 1999	779.9
August 1999	774.8
September 1999	687.7
October 1999	703.1
November 1999	690.8
December 1999	712.7
January 2000	790.2
February 2000	867.9
March 2000	951.6
April 2000	924.5
May 2000	1,008.9
June 2000	991.1
July 2000	1,123.1

Source: Media Metrix, 2000

The 25 Hottest Web Destinations

One logical way to look for Internet trends is to find out which sites get the most visitors each month. Here is Media Metrix's list of the top 25 U.S. Web and digital properties for July 1999 and July 2000. Interestingly enough, many of the top sites in 1999 are still quite popular, and, although there are a few new names on the 2000 list, most of the changes in 2000 are just from sites changing positions in the list.

July 1999

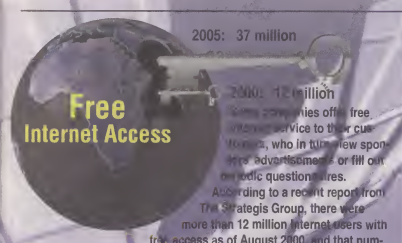
Rank	Web Site/Digital Media Property	Unique Visitors
1	AOL Network (proprietary and WWW)	53,423,000
2	Yahoo! Sites	38,906,000
3	Microsoft Sites	34,681,000
4	Lycos	30,218,000
5	Go Network	21,071,000
6	The Excite Network	16,408,000
7	Time Warner Online	13,060,000
8	Amazon	12,389,000
9	Go2Net Network	11,220,000
10	AltaVista Sites	10,393,000
11	LookSmart	10,057,000
12	Bluemountainarts.com	9,841,000
13	RealSite Portfolio	9,033,000
14	Snap Sites	8,782,000
15	eBay	8,746,000
16	Xoom.com Sites	8,705,000
17	About.com Sites	8,265,000
18	CNET	8,227,000
19	ZDNet Sites	7,982,000
20	Goto.com	7,349,000
21	Juno/Juno.com Application	7,053,000
22	Infospace Impressions	6,775,000
23	AT&T Web Sites	6,683,000
24	Viacom Online	6,456,000
25	Fortunecity Global Community	5,608,000

SOURCE: MEDIA METRIX, 1999

July 2000

Rank	Web Site/Digital Media Property	Unique Visitors
1	AOL Network (proprietary and WWW)	62,545,000
2	Microsoft Sites	50,298,000
3	Yahoo! Sites	49,045,000
4	Lycos	32,119,000
5	Excite Network	27,115,000
6	Go Network	21,848,000
7	About.com Sites	18,282,000
8	AltaVista Network	17,391,000
9	Time Warner Online	16,365,000
10	NBC Internet	15,434,000
11	Amazon	15,383,000
12	Real.com Network	14,723,000
13	eUniverse Network	13,958,000
14	Viacom Online	13,634,000
15	LookSmart	13,374,000
16	eBay	12,528,000
17	Go2Net Network	12,527,000
18	eFront Media	12,417,000
19	Ask Jeeves	11,765,000
20	CNET Networks	10,850,000
21	ZDNet Sites	9,936,000
22	Juno/Juno.com	9,042,000
23	Earthlink	8,985,000
24	GoTo	8,776,000
25	iWon.com	8,758,000

SOURCE: MEDIA METRIX, 2000

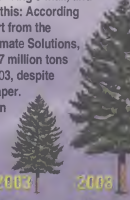


Some companies offer free Internet service to their customers, who in turn view sponsors' advertisements or fill out periodic questionnaires. According to a recent report from The Strategis Group, there were more than 12 million Internet users with free access as of August 2000, and that number will more than triple (to 37 million) by 2005.

SOURCE: THE STRATEGIS GROUP, 2000

Saving Trees

While you're shopping, sending e-mail, and chatting online, consider this: According to a December 1999 report from the Center for Energy and Climate Solutions, the Internet could save 2.7 million tons of paper every year by 2003, despite increased use of office paper. The resulting annual cut in global warming pollution equals 10 million tons of carbon dioxide. Both figures could double by 2008.



SOURCE: CENTER FOR ENERGY AND CLIMATE SOLUTIONS

Top 10 Web Retailers

One of the biggest trends in Internet use is shopping online. PC Data Online compiles a list of the top 10 e-tailers based on online visits and purchases each month. Some sites draw more casual browsers than others, as shown by each site's Buy Rate, which is the percentage of its total unique visitors that make purchases.

July 1999

Rank	Web Site	Unique Users	Projected Buyers	Buy Rate
1	Amazon.com	7,375,000	526,000	7.1%
2	PlanetRx.com	909,000	184,000	20.2%
3	Ticketmaster.com	1,492,000	158,000	10.6%
4	Gateway	1,308,000	115,000	8.8%
5	barnesandnoble.com	2,596,000	111,000	4.3%
6	MotherNature.com	982,000	104,000	10.6%
7	iPrint.com	955,000	97,000	10.1%
8	Hallmark Online	486,000	95,000	19.5%
9	buy.com	1,276,000	85,000	6.7%
10	bigstar.com	843,000	80,000	9.5%

SOURCE: PC DATA ONLINE, JULY 1999

July 2000

Rank	Web Site	Unique Users	Projected Buyers	Buy Rate
1	Amazon.com	18,133,000	1,810,000	10%
2	Ticketmaster.com	5,916,000	676,000	11.4%
3	barnesandnoble.com	5,893,000	338,000	5.7%
4	buy.com	3,334,000	310,000	9.3%
5	drugstore.com	2,030,000	293,000	14.4%
6	Real.com	12,899,000	223,000	1.7%
7	JCPenney	2,466,000	218,000	8.9%
8	sears.com	3,093,000	207,000	6.7%
9	Pets.com	2,059,000	196,000	9.5%
10	CDNOW	5,829,000	191,000	3.3%

SOURCE: PC DATA ONLINE, JULY 2000

The Most Visited News/Information Sites

An increasing number of people are relying on the Internet as a regular news source. News and information Web sites have a big advantage over newspapers and other information sources because they can post breaking news stories almost as they happen. Here are the top 10 Internet news/information sites for July 1999 and 2000, according to Media Metrix.

	Unique Visitors		
Web Site	July 1999	July 2000	Increase Of Unique Visitors
MSNBC	7,114,000	10,041,000	41.1%
About.com	7,938,000	9,720,000	22.4%
weather.com	5,244,000	7,430,000	41.7%
CBS.com Sites*	2,779,000	5,151,000	85.4%
CNN.com	5,073,000	5,117,000	0.9%
TIME.com	5,726,000	4,170,000	-27.2%
The New York Times On The Web	2,749,000	3,015,000	9.7%
ABC News*	3,496,000	3,006,000	-14.0%
USA TODAY	2,585,000	2,517,000	-2.7%
Discovery.com	1,531,000	2,278,000	48.8%

* Represents an aggregation of commonly owned/branded domain names.

SOURCE: MEDIA METRIX, JULY 2000

Point, Click & Travel

More people are using travel-related Web sites to plan vacations than ever before, and, according to a report published by Forrester Research in 1999, this trend will continue. By 2003, 25% of all U.S. households will book vacations online. The report also ranked the top travel-related Web sites using a scoring system based on each site's reach, bookings, and revenues.

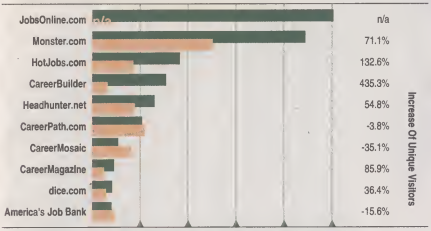
Rank	Site	Total Score
1	Yahoo!	13.6
2	Travelocity	11.9
3	Expedia	9.4
4	Southwest	8.9
5	Excite	7.9
6	America Online	7.8
7	Netscape	7.7
8	American Airlines	6.5
8	Delta Air Lines	6.5
9	Infoseek	6.3
10	Preview Travel*	5.7
11	AltaVista	5.3
12	United Airlines	5.1
12	Marriott	5.1
13	Holiday Inn	4.7
14	Northwest Airlines	3.9
15	Hertz	3.7
16	Continental Airlines	3.5
17	US Airways	3.3
18	priceline.com	3.2
19	Lycos	3.0
20	Cheap Tickets	2.6
20	Alamo	2.6

* Preview Travel merged with Travelocity earlier this year.

SOURCE: FORRESTER RESEARCH, 1999

Leading Career Sites

Who needs the local classified ads when you can go online and look for a job (or an employee) anywhere in the world? Media Metrix ranks the top career sites each month based on the number of unique visitors at each site per month.



Source: Media Metrix, July 2000

Top 10 Viruses

The Love Letter virus, also known as the Love bug, caused a stir in early 2000, but it is only third on Sophos Anti-Virus' July 200 list of the 10 most-reported viruses.

Rank	Virus Name	Type	Percentage Of Reports
1	Stages-A	Virtual Basic Script	7.9%
2	Kakworm	Virtual Basic Script	5.7%
3	LoveLetter-G	Virtual Basic Script	5%
3	Marker-O	Word 97 macro virus	5%
5	FF-F	Word 97 macro virus	4.3%
5	Panther-B	Word 97 macro virus	4.3%
7	Yawn-A	Excel 97 macro virus	3.6%
8	Jerk-I	Office 97 macro virus	2.9%
8	Ethan	Word 97 macro virus	2.9%
8	Marker-C	Word 97 macro virus	2.9%
	Others		55.5%

Source: Sophos Anti-Virus, July 2000

Quality Counts

The quality of service a Web site provides is becoming more important as the Web becomes a bigger part of our daily lives. CyberAtlas and Web solutions firm Watchfire released a report in July 2000 that ranked 15 frequently visited sites/digital properties on quality.

(*NOTE: CyberAtlas and Watchfire came up with the following rankings by scanning the first 5,000 links in each company's Web site for factors such as broken internal and external links, pages missing titles, and slow-loading pages. Smaller sites containing 1,000 or fewer links had somewhat of an advantage because the probability of bad links on such sites is less.*)

Rank	Company
1	Hotmail
2	Yahoo!
3	eBay
4	LookSmart
5	MSN
6	GeoCities*
7	AOL
8	Blue Mountain Arts
9	Angefire
10	Netscape
11	HotBot
12	AltaVista
13	Real.com
14	Excite
15	Lycos

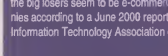
* Merged with Yahoo!

Source: CyberAtlas.com; Copyright internet.com, 2000

Scared To Shop

Whether Internet dangers are real or perceived, the big losers seem to be e-commerce companies according to a June 2000 report from the Information Technology Association of America.

Of 1,000 survey respondents:



61% are less likely to shop online because of cybercrime, while just 33% said cybercrime has no adverse effect on their online consumption

Source: Information Technology Association of America, EDS, July 2000

Hacker Protection

Although most users take steps to protect their PCs and data against viruses, they don't do as much as they can to protect themselves from hackers. In July 2000, Symantec released the results of an Applied Marketing Research survey of 300 people that indicates 87% of consumers and 95% of technology professionals use antivirus software but only 19% of consumers and 49% of technology professionals have personal firewalls on their PCs. According to the survey, "nearly 85% of consumers and more than 70% of IT [information technology] professionals know how to protect themselves from cybercrime."

Source: Applied Marketing Research, 2000

Top 10 Entertainment Sites

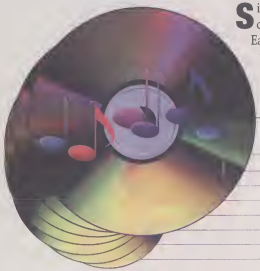
Despite all the emphasis today on e-commerce, online trading, and real-time worldwide communications, some people still like to go online just for fun. There are plenty of fun sites on the Web, and thanks to Media Metrix, we have a list of the 10 most popular entertainment sites as of June 2000 (based on the number of unique visitors each site received that month).

	Sites	Unique Visitors
1	Real.com	12,786,000
2	Snap Search and Services*	10,115,000
3	About.com	7,499,000
4	Disney Online*	7,040,000
5	SpeedyClick.com	6,159,000
6	FreeLotto	5,890,000
7	Entertaindom -Warner Bros. Online*	5,633,000
8	Uproar	5,404,000
9	Webstakes.com	5,113,000
10	Macromedia	5,004,000

* Represents an aggregation of commonly owned/branded domain names.

SOURCE: MEDIA METRIX, JUNE 2000

Most Popular Digital Music Sites



Sites that offer digital music downloads or provide software to play digital music have been at the center of controversy and litigation lately, but they are still dramatically increasing in popularity. Each week, Media Metrix releases a report on the top digital music sites based on the numbers of unique daily visitors each site averages during the week. The stats below are for the week ending July 30, 2000. (*NOTE: Sites that average less than 50,000 daily unique visitors do not register on Media Metrix surveys.*)

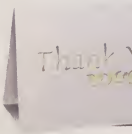
Rank	Site	Average Daily Unique Visitors
1	Real.com	2,013,000
2	Napster.com	920,000
3	MTV.com	169,000
4	ARTISTdirect Network	121,000
5	MP3.com	114,000
6	Scour	113,000
7	BMGmusicservice.com	109,000
8	sonicnet.com	53,000
8	LAUNCH.com	53,000

1 = 50,000 Unique Visitors

SOURCE: MEDIA METRIX, JULY 30, 2000

May I Help You?

One trend on the Web is the growing popularity of sites that simplify or improve surfers' experiences on the Web. PC Data reported in July 2000 that several sites in this category made impressive gains to reach its Top 100 list of Web sites in June 2000. The smallest gain among sites in the report was 13 places. (*NOTE: Sites are in order of the magnitude of their growing popularity according to PC Data's research.*)



Site	Function	May 2000 Rank	June 2000 Rank	Rank Improvement
V3.com	provides free URL redirects for sites with lengthy addresses	1,599	87	1,512
Nextcard.com	Visa-related site that offers shopping concierge services	107	53	54
Mailbits.com	notifies subscribers of free offers and daily discounts by e-mail	89	45	44
Coolsavings.com	provides discounts and coupons from across the Web	85	50	35
half.com	retail/auction site that sells everything for at least 50% off	124	91	33
Gator.com	offers free "virtual wallet" for storing user names, account numbers, and passwords	105	81	24
Paypal.com	simplifies online bill payment	111	98	13

SOURCE: PC DATA, JULY 2000

Dial-up vs. Broadband Access

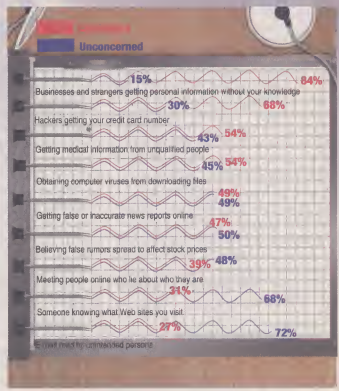
Most experts expect broadband Internet use to rise sharply in the next few years as streaming digital media becomes more common. But Internet research firm eMarketer recently reported the number of new Internet users with dial-up access will continue to increase until 2003, when it will decrease for the first time.

Virus Incidents Increasing

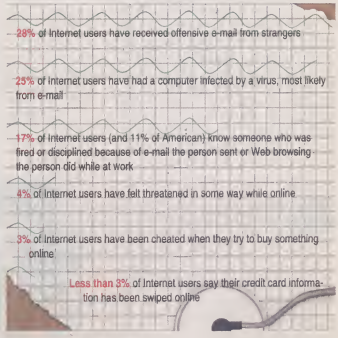
In 1988, the Defense Advanced Research Projects Agency (DARPA) established the Computer Emergency Response Team (CERT) to monitor and deal with security issues faced by researchers on the Internet. CERT has been tracking the number of security incidents involving viruses and security breaches reported by researchers since that time. Since 1988, the numbers of reported incidents from year to year has declined only once. In addition, in just the first half of 2000, there were nearly as many reported incidents as in all of 1999.

Hackers, Viruses & Fraud

One of the biggest issues surrounding the Internet is that of user privacy. People worry about a number of things happening because of their Internet use, according to a 2000 Pew Internet & American Life report.



Despite all of its potential pitfalls, respondents in the same study indicated that actual incidences of these unpleasant events were modest.


28% of Internet users have received offensive e-mail from strangers
25% of Internet users have had a computer infected by a virus, most likely from e-mail
17% of Internet users (and 11% of American) know someone who was fired or disciplined because of e-mail the person sent or Web browsing the person did while at work
4% of Internet users have felt threatened in some way while online
3% of Internet users have been cheated when they try to buy something online
Less than 3% of Internet users say their credit card information has been swiped online

SOURCE: PEW INTERNET & AMERICAN LIFE, 2000

Internet Unleashed

7 Million Pages A Day & No End In Sight

Talk about the American dream; the Internet began as an obscure government research project in the late '60s and has become a worldwide juggernaut that grows by 7 million pages each day, according to Internet research firm Cyveillance. Thanks to extensive marketing in television, radio, and magazines, even people that have never used the Internet know about it. And most of these people know somebody who uses it regularly. Having so much information about every conceivable topic available 24 hours a day, 365 days a year combined with almost limitless possibilities for commerce and communication is literally changing the world. The Internet is growing and evolving so fast that some experts say in another generation or so people will be using the Internet as commonly as they watch television or use the telephone today.

■ **Power To The People.** One of the most compelling things about the Internet is how quickly people all over the world are becoming involved. In the late '80s and early '90s, most people hadn't heard about the Internet. Even if they had, it wouldn't have mattered because there was virtually no content targeted at the general public. Just as importantly, tools such as Microsoft's Internet Explorer and Netscape's Navigator weren't around to make navigating the Web easy. The Internet was far from the slick, point-and-click operation it is today. In fact, it wasn't until 1990 that the first commercial provider of dial-up Internet access went into business.

In the span of just a few years, however, early adopters and technophiles embraced this new global network, and the more people that became involved the faster it grew. According to Nua Internet Surveys, just 26 million people were online by the end of 1995, which is less than 1% of today's world population. Market research firm IDC indicates that number had risen to 36 million users by December 1996 and then to 70 million in December 1997, when the number of Internet users reached nearly 1.71% of Earth's population at that time. Internet users more than doubled during the next year to 160 million by December 1998. By September 1999, Nua says Internet users worldwide totaled 201.05 million and 4.78% of the population, and, as of July 2000, there were 359.8 million people online. Nua Internet Surveys estimates that nearly 6% of everyone on earth is online today, and analysts expect this explosive growth to continue.

■ **The Internet Olympics.** North America presently leads the world in Internet penetration according to most estimates. In July 2000, Nua Internet Surveys reported the United States and Canada had 157.24 million Internet users, which is 63.02 million more than in all of Europe. The Strategis Group, a telecommunications consulting company, released a report in February 2000 indicating 14.9 million U.S. households had Internet access in 1995 and 46.5 million had it in February 2000. The report also predicted 90 million U.S. households will be online by 2004.

Because such a large segment of the American population is already online, however, the potential for the most growth from this point on exists elsewhere in the world. "Huge swaths of Asia, Latin America, and even Africa have yet to experience this stuff, so there's huge growth yet to come," says Lee Rainie, director of the Pew Internet & American Life Project, which is a nonprofit Internet research initiative. In July 2000, investment bank Lehman Brothers published the "Asian Internet Forecasts: Wiring Up For Growth" report, which predicts Asian Internet users will triple from 77.6 million in 2000 to 233 million in 2003.

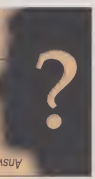
The Computer Industry Almanac reports Internet users in the United States accounted for 43% of the worldwide total at the end of 1999. In addition, it also reported that figure will shrink to 33% by 2002 and to 27% by the end of 2005.

■ **More Pages Than "War And Peace."** There are many reasons all those millions of people are flocking to the Internet, including e-mail, chat rooms, and an ever-growing assortment of Web pages, pages where you can buy or sell things, pages where you can download music and pictures, and pages that are just fun to visit. As we mentioned earlier, Cyveillance estimates the Internet (more specifically the World Wide Web) grows by more than 7 million pages each day. As of July 10, 2000, the company estimated there were 2.1 billion Web pages, and some sources suggest that number may be considerably less than the actual count. In any event, Cyveillance's World Wide Web site (http://www.cyveillance.com) features a real-time Web page counter that demonstrates just how fast people are adding pages to the Web. According to this, and given the Web's present size and rate of growth, the Web will double in size early in 2001.

Of course, the majority of Web pages are part of much larger sites. Each site has its own domain name, such as the "smartcomputing" in http://www.smartcomputing.com, and it is registered with a domain registry service, such as Network Solutions (http://www.network solutions.com). The domain name also includes a suffix that identifies its top-level domain. **Top-level domains**, such as ".com," ".org," and ".net," classify sites into commercial, nonprofit, educational, or other categories. There also are many top-level domains set aside for use in specific countries, such as ".jp" for Japan, ".uk" for the United Kingdom, and ".lv" for Latvia. The rampant growth of the Web has also prompted Web architects to draft newer, more specific top-level domains such as ".arts," ".shop," and ".info" to deal with the increasing scarcity of Web addresses. The Internet Corporation for Assigned Names

GUESS WHO?

In the July 1945 *Atlantic Monthly* article "As We May Think," this former science advisor to President Roosevelt foretold the creation of hypertext and the Web decades before those technologies first appeared.



Answer: Vannevar Bush

and Numbers (ICANN) began accepting proposals for such new designations in September 2000. An announcement at ICANN's Web site (http://www.icann.org) indicates the ICANN Board of Directors will announce its final decisions by mid-November 2000.

Just how badly do we need new top-level domains? According to NetNames, another domain registry service, the number of registered domain names more than doubled from 9,164,503 to 21,478,681 between August 4, 1999 and August 29, 2000. Each of the three largest top-level domains, .com, .net, and .org, more than tripled during that period so it's no surprise people are having trouble coming up with good domain names that are still available.

■ The Machines Behind The Scenes. Each of the more than 2 billion Web pages floating in cyberspace is stored on a computer somewhere in the form of data. The computers that provide this data each time you direct your Web browser to a Web site or page are called Web servers because they serve up the data your computer asks for. IT (information technology) people also call them hosts in the context of computer networks and the Internet. It is important to note the number of hosts on the Internet does not directly correlate to the number of Web sites because each computer that accesses the Web is considered a host, as well. A computer may only be a temporary host, but if it has a specific IP (Internet Protocol) address (the address of a computer on the Internet that is written as four groups of up to three digits, each separated by periods) or has one assigned to it by a ISP (Internet service provider) or online service, it is still a host. Some sites originate from a group of computers acting as one Web server; others originate from a computer that hosts multiple sites. In any event, counting hosts is another way to gauge the Internet's overall size and growth.

The Internet Software Consortium (ISC) is a nonprofit organization that develops applications that facilitate the use of Internet protocols. It conducts surveys each January and June to find out how many hosts there are across the Internet. It does this with the help of Internet DNSes (domain name servers) that track domain names and their corresponding IP addresses. DNSes translate the Web addresses you type into your Web browser into the proper IP addresses so your computer can find the information you request. The ISC's survey queries DNSes with the full range of IP addresses that applicants can register as domains and counts the computers that respond. The results of the January 1993 survey indicated 1,313,000 hosts were on the Internet. As of January 2000, 72,398,092 hosts were online, which means there were 55 times more computers connected to the Internet in 2000 than just seven years earlier in 1993.

They Said It...

"When you spend your time on the Internet, you don't hear a human voice and you never get a hug."

-Norman Nie,
Stanford political scientist,
The New York Times, Feb. 16, 2000.

The number of actual Web servers, however, is considerably less. Security Space, which is a Web site developed and maintained by E-Soft, a consulting firm with expertise in Internet security and online services, publishes the number of servers on the World Wide Web (just the Web, not the entire Internet) each month as part of its Web survey. As of August 2000, 2,160,902 active servers were on the Web hosting pages you can get to from hyperlinks at other sites. That is more than twice the 1,028,157 servers the survey found in August 1998.

■ Means To An End. To surf the World Wide Web, you need a computing device capable of accessing phone lines or dedicated data lines and speaking the language of the rest of the computers online. Although people are increasingly using other types of Web-enabled devices, most Internet users still use PCs to get online. Moreover, judging by the number of PCs in use worldwide, there's plenty of room for Internet use to grow even further. The "Roper Reports Worldwide Spring 2000" study released by market research firm Roper Starch Worldwide in July 2000 indicates three of every 10 consumers worldwide owns a PC. Asia leads the way in PC ownership at 55% (Taiwan boasts 60% and Japan reported 50%), with North America coming in second at 51% ownership. The study also reports 20% of the world's PC owners (or 6% of the overall population) went online in July 2000, led by 41% of North Americans and 32% of Asians.

But PCs aren't the only way to get online. An increasing number of people are using wireless Web-enabled mobile phones, PDAs

Quick Tips

You don't have to pay money for software that claims to speed up your Internet connection. Most software accomplishes this by resetting your MTU (maximum transmission unit) to a more optimal number. In Windows 98, you can do this yourself by right-clicking Network Neighborhood on your Desktop and selecting Properties. On the Configuration tab, double-click your Dial-Up Adapter and click the Advanced tab in the resulting properties window. Highlight IP Packet Size and choose between Automatic, Large, Medium, or Small in the Value field. This will change your MTU settings to the best type for your system, 1,500 bytes, 1,000 bytes, and 576 bytes, respectively. Experiment with different settings to find an optimal MTU size for you.

Dates To Remember

In October 1990, the World Wide Web was born when Tim Berners-Lee started working on his hypertext document system. His Hypertext Transfer Protocol, or HTTP, set of standards lets user communicate using computers in different networks, so it works very well on the Internet.

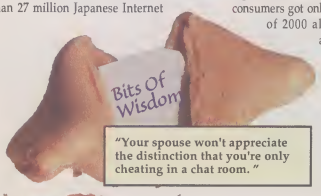
GUESS WHO?

In a popular 1984 novel about a bleak futuristic society, this science-fiction author coined the terms "cyberspace," "matrix," and other words commonly used on the Web today, yet he refers to the Internet as "a waste of time."

Answer: William Gibson

(personal digital assistants), and various other types of Internet appliances to surf the Web. The most growth in wireless Web access is taking place outside the United States, according to digital communications research firm Cahners In-Stat Group. Cahners' September 2000 report on the wireless data/Internet market's growth suggests users in the United States may be slower than users in other regions to adopt wireless access because Americans are used to high-speed access on large color PC monitors, and most wireless access devices are comparatively slower and display little or no graphics. On the other hand, Cahners reports there are more than 100 million wireless phones in the United States. In addition, recent research conducted by The Strategis Group indicates approximately 30% of U.S. wireless phone users are interested in mobile Web access and would be willing to pay as much as $13 more per month for Web service and $61 more per month for Internet-ready phones. Whether or not wireless access catches on in the United States, though, the Strategis Group estimates the worldwide wireless data market will explode from approximately 170 million subscribers this year to more than 1.3 billion sometime in 2004.

Mobile Internet use is catching on especially quickly in Japan, where people have been slower to jump into the home PC market because of cost. In June 2000, the Japanese Ministry of Posts and Telecommunications reported 10 million of the just more than 27 million Japanese Internet users go online through mobile connections. The popularity of mobile Web access in Japan is probably due in part to the success of the i-mode mobile Web phone standard introduced in 1999 by communications company NTT DoCoMo. i-mode phones have larger, higher-resolution LCDs (liquid-crystal displays) than domestic WAP (Wireless Application Protocol) phones. This helps them display crisper text than WAP phones and even some graphics (some i-mode phones have 256-color displays). And because programmers construct i-mode sites with a subset of HTML (Hypertext Markup Language, the language used to design standard Web pages) called cHTML (compact HTML), i-mode sites are easier to program than WAP sites. DoCoMo hopes to expand beyond the Japanese market eventually so do not be surprised if i-mode phones show up in the United States in a year or two.



The Gatekeepers. The increasing popularity of the Internet has been a positive boon to the ISP industry, which now includes approximately 9,300 companies worldwide, according to internet.com's The List (http://www.thelist.internet.com). The most recent Telecommunications Reports International (TRI) quarterly Online Census report indicates more than 5 million U.S. consumers got online during the first quarter of 2000 alone. TRI reports this is an 11% increase since 2000 began and a 62% increase during the first quarter in 1999. Because of this growth, the six largest ISPs in the country, including America Online, NetZero, EarthLink, CompuServe, MSN Internet Access, and AT&T WorldNet, now serve almost 50.3 million customers, which is 73% of the total online audience, according to TRI. Dial-up Internet access alone increased by 10% in the first quarter, and broadband service accounts grew even faster. Cable modem access jumped 44% in the United States, and DSL (Digital Subscriber Line) increased by an amazing 183%. The only sour note for service providers was a 2% slip in the number of Internet TV subscribers, which fell to 1,115,300. Microsoft's WebTV service continued to dominate this category, serving more than 98% of all Internet TV subscribers.

Many experts credit much of the new growth in Internet subscribers to the aggressive offers of emerging ISPs, free ISPs, and online services. A prime example is MSN's (Microsoft Network's) deal with major computer and electronics retailers such as Best Buy to provide rebates on retail purchases in exchange for signing up for three years of service. Cahners In-Stat Group predicted in March 2000 that about 60% of U.S. households will have Internet access by the end of the year, spurring more than $2.2 billion in additional ISP revenue from dial-up customers alone. Businesses that subscribe to ISPs have provided ISPs with a boost, as well. In November 1999, Cahners In-Stat Group reported that the business ISP market experienced 100% growth during 1999 and that it would be worth $63 billion in 2002.

Just the Facts!

During 2000, the number of women online surpassed the number of men online for the first time. Women 55 years old and older presently make up the largest segment of women on the Internet. (Source: Media Metrix, August 2000)

Free ISPs such as NetZero and 1stUp.com are making large strides, also, as consumers adopt free service in exchange for on-screen advertisements and survey participation. Juno Online Services alone attracted 2 million subscribers in less than four months after launching in December 1999. Jupiter Communications predicted in December 1999 that free ISPs would have 13 million customers by the end of 2000 and would account for 13% of all U.S. ISP accounts.

The Right Tool For The Job. We alluded earlier to the fact that Web browsers such as Microsoft's Internet Explorer and Netscape's Navigator helped the Internet grow in a big way by simplifying it for inexperienced

Quick Tips

If you get tired of hearing your modem beep and squeak, you can easily silence it. Open the DIAL-UP NETWORKING folder in My Computer. Right-click the connection you want to silence and select Properties. One the General tab, click the Configure button near the bottom of the window and then move the slider all the way to the left. Click OK. If your modem continues to make noise, right-click the connection, select Properties, and click Configure. Then, click the Advanced button under the Connection tab. Type **atm0l0** in the Extra Settings text field and click OK.

Dates To Remember

By Dec. 31, 1991, the Internet included more than 5,000 networks in three dozen countries. It had 700,000 host computers that served pages to more than 4 million people.

users. Along the way, though, an interesting thing happened: Web browsers went from being pricey competitive retail products to giveaway items. Zona Research reported on the competition between various browsers in November 1999 and made this interesting observation: In 1996, there were nine browsers fighting for a stake in a market worth $200 million. Nearly four years later, there were really only two serious contenders left (Microsoft's browser and Netscape's browser), and they were competing for a market worth zero dollars.

In June 2000, WebSideStory's StatMarket pronounced the browser war officially over as it announced that 86.08% of Internet users around the world use Microsoft's Internet Explorer. Only 13.9 % use Netscape's browser, which is an almost 20% drop from February 1999 when Netscape Navigator claimed 33.43% of the market. Internet Explorer's share of the market, on the other hand, rose more than 22% during the same period from 64.06%. There are varying numbers from other research firms that estimate Netscape's market share is a little more, but it's clear that Internet Explorer has cornered the browser market. It seems likely that Microsoft's bundling of the browser along with its Windows 95 OS (operating system) and integrating it with Windows 98 OS played a big part in its dominance. This, of course, has been a large factor in the U.S. Justice Department's antitrust case against the world's leading software company, but, as of yet, that hasn't changed the face of the market. (*NOTE: See the "Software" section in this issue for more information about Microsoft's legal woes.*)

■ **Going E-postal.** Few would disagree that e-mail has been one of the largest contributing factors to the rapid growth of the Internet. In October 1999, the results of PricewaterhouseCoopers' 1999 Consumer Technology survey revealed 48% of U.S. Internet users polled went online primarily for e-mail. By comparison, 28% say they went online primarily to do research, an exact reversal of the results of the same survey one year earlier. Later that same month, the U.S. General Accounting Office released a report that claimed the Internet and electronic billing might render first-class mail service "extinct," and that it would cost the Postal Service $17 billion over the ensuing 10 years. More specifically, the report estimated that first-class mail would peak in 2002, then decrease by 2.5% per year until 2008.

It's too early to tell whether these predictions will come to pass, but the Postal Service has responded to e-mail and the Internet in general by proactively launching a wide range of its own Internet services and expanding existing services such as priority mail. It is clear, though, that e-mail is making its mark. If you multiply the average number of e-mail messages America Online subscribers send daily, 5.24, by the number of Americans with Internet access (144 million in August 2000 according to Nielsen/NetRatings), you get 754.56 million e-mail messages per day in the United States alone. In addition, given the likelihood that many people use company e-mail at work to send even more messages than with their home accounts, the number could be much larger.

To put the e-mail boom into perspective, consider the results of Messaging Online's "Year-end 1999 Mailbox Report," released in August 2000. The report states the number of e-mail inboxes worldwide increased by 83.5% during 1999 and was at 569,171,660 in August 2000. It's hard to say exactly how many people that number represents because the average user has between 1.5 and four e-mail addresses (and, therefore, mailboxes), but it is a considerable number nonetheless. Messaging Online goes on to predict that the world total may reach 1 billion in about two years, at which time e-mail mailboxes will outnumber televisions and telephone lines.

■ **Incredible Journey.** There are few technological tools that get as much hype as the Internet, and, although it may sound like a sales pitch, sometimes it's hard not to marvel at how fast it has grown and how important it has become. What's even more amazing is this enormous worldwide network has really just scratched the surface of its potential given the vast number of people it has yet to touch. The equipment we use and the things that we do online may change as time passes, but it's a safe bet that the Internet will continue to grow and to evolve long after present generations have "gone offline." RS

by Chris Trumble

Do You Know...

...how many households around the world have Internet access?

According to International Data Corp., 66.6 million households worldwide have Internet access as of 2000, with North America leading the way at 38.2 million, or more than half of the worldwide total. Europe comes in second with 16.5 million wired households, and Asia and the Pacific Rim come in third with 10 million. The rest of the world has about 1.9 million Internet households.

The Internet Evolution

Although it started as a small network of university and government research-facility computers, there's nothing small about the Internet anymore. It is constantly evolving and growing, changing the way we live. In this section, we'll look at how it is growing, both in terms of sites and number of users, and we'll identify some specific statistics that help explain this phenomenal growth.

Web Surfers By Region

For every 1,000 people in the world, 57.49 have Internet access. Individual regions differ greatly in Web populations, though. For example, one of every two North Americans has Internet access, but approximately only eight of every 1,000 Middle Easterners and Africans have access.

Region	Surfers (per 1,000 people)
North America	452.8
Western Europe	220.5
Eastern Europe	37.2
Asia and the Pacific	30.7
South and Central America	38.40
The Middle East and Africa	7.88

SOURCE: COMPUTER INDUSTRY ALMANAC, 1999

Registered Domain Names

In April 2000, *The Wall Street Journal* estimated that approximately 98% of the words in Webster's English Dictionary had been registered as domain names.

SOURCE: THE WALL STREET JOURNAL, APRIL 24, 2000

Consumer Sales Drive E-commerce Growth

Although business-to-business (B-to-B) e-commerce is certainly on the rise, but according to NetRatings research, the majority of e-commerce sites still target consumers. In addition, the number of sites that cater to consumers is growing larger each year in proportion to B-to-B sites. ActivMedia reports that total e-commerce activity will double during 2000 alone, from $58 billion to $ 32 billion worldwide.

Online Business	Years The Site Has Been Online		
	1 or less	2 years	3 years or more
Total sample	148	164	317
Sell or market to consumers	51	65	155
Sell or market to businesses	32	36	38
Media/portal/information/publishing/search and directory sites	10	8	8
Internet services and support	7	5	9
Sell or market to education/nonprofit/government	1	2	3

SOURCE: "REAL NUMBERS BEHIND 'NET' BUSINESS MODELS," MCKINSEY & COMPANY, JUNE 2000

Nine To Five

In August 2000, Pitney Bowes released the results of its fourth-annual study of electronic communications in the workplace. The report indicates the use of electronic

Compiled by Chris Trumble
Graphics & Design By
Andria Schultz & Ginger Riley

How Many E-mail Messages?

America Online (AOL) reported in February 2000 that its membership had reached the 21-million mark and that its members send 110 million e-mail messages daily. That's 5.24 messages per person, per day. If you apply those numbers to the total number of Americans with Internet access (144 million as of August 2000 according to Nielsen//NetRatings), you get 754.56 million e-mail messages sent each day in the United States alone. That's 31,440,000 messages per hour, 524,000 per minute, and 8,733.33 per second.

SOURCE: AOL, FEBRUARY 2000; NIELSEN//NETRATINGS, AUGUST 2000

U.S. Households Online

More than half (52%) of U.S. households had Internet access as of July 2000, according to research by Nielsen//NetRatings. This represents a 35% increase over the same period last year, thanks to cheaper computer hardware, more free Internet access, and cheaper broadband access. Nielsen expects these trends to continue, and Cahners In-Stat Group agrees. The market research firm predicts 60% of American households will be online by the end of 2000.

SOURCE: NIELSEN//NETRATINGS, 2000; CAHNERS IN-STAT GROUP, 2000

Number Of Worldwide Internet Users

It is logical to assume the rate of the Internet's growth will fluctuate based on technological advances and economic conditions around the world. However, according to Nua Internet Surveys, the number of worldwide Internet users increased 94.2% between July 1999 and July 2000. If the number of users continues to grow at this rate, there will be more than half a billion, 698.7 million, Internet users around the world by July 2001.

communications tools in the office has increased dramatically in both Europe and North America during the past year, including considerable increases in:

- The number of e-mail messages sent and received (up 10%)
- Use of company intranets (up 12%)
- Use of the Internet (up 18%)

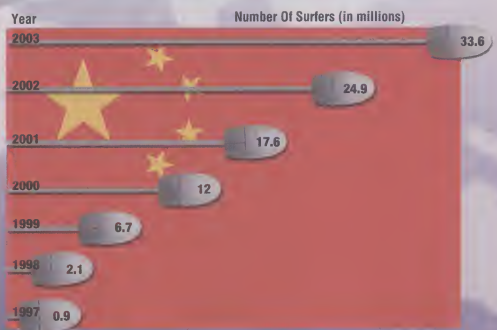
The study also showed the following usage statistics:

- 84% of American workers use the Internet every day or several times a week, compared to 74% of Canadian workers, 61% of workers in Germany and the United Kingdom, and 55% of workers in France.
- 97% of American workers use e-mail every day or several times a week.

Chinese Surfers

SOURCE: NUA INTERNET SURVEYS, 2000

The Strategis Group reports that China has the fastest growing Internet population in Asia. The company predicts the Chinese online population will almost double in 2000.



SOURCE: STRATEGIS GROUP, 2000

E-commerce Is Becoming M-commerce

The number of people who access the Internet through mobile wireless devices such as Web-enabled phones is growing rapidly, and m-commerce (e-commerce transactions that take place over mobile wireless Internet access) is growing with it. Although m-commerce growth in Europe has outpaced mobile e-commerce in the United States to date, market analysts at Datamonitor reported in August 2000 that this trend will change eventually. The U.S. m-commerce solutions market, or the sales of hardware, software, and services for implementing m-commerce, will grow by 1,000%, from $90 million in 2000 to $1.2 billion in 2005, and the United States will eventually surpass Europe in m-commerce growth.

SOURCE: DATAMONITOR, 2000

2 Billion Served

The number of pages on the World Wide Web is growing at an amazing rate. Internet market research firm Cyveillance reports that 2.1 billion "unique, publicly available" pages were on the Web as of July 10, 2000. The company's research also indicates the Web is growing at a rate of more than 7 million pages per day, and that it will double its present size early in 2001.

The report also indicated the following information about existing Web pages:

- Average size of pages: 10,060 bytes
- Average number of internal links per page: 23
- Average number of external links per page: 5.6
- Average number of images per page: 14.4
- Percentage of U.S. vs. international pages: 84.7% vs. 15.3%

SOURCE: CYVEILLANCE, JULY 2000

Rapid Increases In Internet Hosts

Each computer connected to the Internet has its own unique IP (Internet Protocol) address, or it is assigned one when necessary for data transmission and becomes a host. One way to measure the growth of the Internet is to look at the number of hosts on the Internet. The Internet Software Consortium does a periodic survey of the DNS (domain name system), a network of computers that tracks domain names and their respective IP addresses. As you can see, the number of host computers connected to the Internet has grown dramatically since 1993.

SOURCE: INTERNET SOFTWARE CONSORTIUM, 2000

Deep Web

As impressive as the latest figures on the Web's size are, they may just be scratching the surface, according to Internet technology company Bright Planet. Bright Planet has uncovered a vast reservoir of online information that it claims is beyond the reach of standard search engines, the largest of which individually index 16% of the "surface Web" at most. Bright Planet calls this immense collection of digital documents the "deep Web," and reported in July 2000 that it is "500 times larger than the known World Wide Web," and it represents the largest growing category of new information on the Internet.

The deep Web is 7,500TB (terabytes, approximately trillions of bytes) of information, compared to the 19TB of data that make up the surface Web. It also has nearly 550 billion individual documents compared to the 1 billion of the surface Web. Sixty of the largest deep Web sites collectively contain more than 750TB of information, which, by themselves, exceed the size of the surface Web by 40 times.

SOURCE: BRIGHT PLANET, JULY 2000

Browser Use

Several years ago, Microsoft's Internet Explorer and Netscape's Navigator Web browsers were in a titanic struggle for market dominance. Then Microsoft changed the rules of the game by bundling its Web browser with its Windows operating system, its Office productivity suite, and other applications, pulling the proverbial rug out from beneath Netscape. Now, both products are available free of charge and the battle is over.

At one time, more than half of all Internet users used Netscape Navigator to get around the World Wide Web. However, according to WebSnapshot.com, a service of MyComputer.com (http://www.websnapshot.com), the number of Navigator users has fallen, and Navigator users now make up only 20% of the market.

SOURCE: WEBSNAPSHOT BY MYCOMPUTER.COM, 2000

Domain Names On The Rise

According to Internet domain registry service NetNames, the number of registered domain names, such as smartcomputing.com, more than doubled from 9,164,503 to 21,478,681 between Aug. 4, 1999 and Aug. 29, 2000. The .com, .net, and .org top-level domains each more than tripled during the past year. The third- and fourth-largest top-level domains were .uk (United Kingdom) with 2,078,474 domain names and .de (Germany) with 1,732,994.

Top-Level Domain	Number Of Registered Domain Names	
	Aug. 4, 1999	Aug. 29, 2000
.com	5,594,558	17,050,817
.net	770,533	2,806,721
.org	529,871	1,614,740
.edu	5,673	5,673
.gov	717	730

SOURCE: NETNAMES, AUGUST 2000

Increasing Internet Usage

Nielsen//NetRatings released research in August 2000 that indicates Americans spend two hours more per month online than they did in 1999. In addition, the number of Web pages they view more than doubled, although, it is interesting to note that the average American surfer visits fewer unique pages. In other words, we're visiting our favorite pages twice as much.

	Page Views Per Month	Number of Unique Sites Visited	Time Spent Per Month (Hours: Minutes: Seconds)
July 2000	728	10	9: 30: 53
June 2000	664	10	9: 04: 29
May 2000	682	10	9: 09: 26
April 2000	671	11	9: 26: 23
March 2000	679	10	9: 42: 57
February 2000	628	10	9: 19: 20
January 2000	628	10	9: 24: 39
December 1999	548	9	8: 17: 09
November 1999	521	10	8: 06: 58
October 1999	524	11	8: 12: 37
September 1999	396	11	7: 20: 51
August 1999	351	11	7: 48: 53
July 1999	350	12	7: 59: 00

SOURCE: NIELSEN//NETRATINGS, 2000

Internet Use At Work vs. At Home

Nielsen//NetRatings compared the Internet use of survey participants at home to their use at work for July 2000. The survey showed a dramatic increase of time spent using the Internet at work vs. at home, as well as longer surfing sessions and more time spent at each page.

	At Home	At Work
Number Of Sessions Per Week	12	37
Number Of Unique Sites Visited	10	28
Page Views Per Week	709	1,337
Page Views Per Surfing Session	38	36
Time Spent Per Week (Hours: Minutes: Seconds)	9: 40: 53	39: 09: 54
Time Spent During Surfing Session (Hours: Minutes: Seconds)	0: 31: 32	0: 32: 25
Duration Of A Page Viewed (Hours: Minutes: Seconds)	0: 00: 50	0: 00: 52

SOURCE: NIELSEN//NETRATINGS, AUGUST 2000

The Ever-Expanding Web Address

If you lined up every Web address in existence from end to end, and you used the same lettering that is on a standard American stop sign, that Web address would be 27,000 miles long. (To put that in perspective, the circumference of Earth is about 24,000 miles.)

SOURCE: DOTCOM.COM, 2000. REPRINTED FROM THE WEB SITE DOTCOM.COM WITH THE EXPRESS PERMISSION OF NETWORK SOLUTIONS INC. ALL APPLICABLE COPYRIGHTS REMAIN THE PROPERTY OF NETWORK SOLUTIONS INC.

E-mail Takes Over

In its "Year-end 1999 Mailbox Report," Messaging Online announced the total number of online mailboxes worldwide increased by 83.5% to 569,171,660 during 1999. During the same period, mailboxes increased in number faster throughout the rest of the world than they did in the United States. The United States had a 73% growth to 333.5 million mailboxes. Elsewhere, mailboxes increased by 101% to 235.6 million. At its present rate of growth, the number of mailboxes could reach 1 billion by the end of 2001.

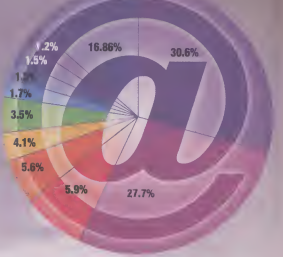
SOURCE: MESSAGING ONLINE, 2000

The Internet Is Big Business

The vast popularity of the Internet hasn't gone unnoticed by the business community. Online advertising and selling products and services online has become a huge source of revenue for companies of all sizes, and e-commerce growth shows no sign of slowing. According to Jupiter Research, spending on online advertising will grow from $3.5 billion in 1999 to $16.5 billion in 2005.

Media Spending	1999	2000	2001	2002	2003	2004	2005
	Online Advertising In Billions						
financial services	$0.7	$1.1	$1.3	$1.6	$1.9	$2.1	$2.4
media	$0.6	$0.8	$0.9	$1.1	$1.3	$1.4	$1.5
computer hardware & software	$0.6	$0.7	$0.9	$1.0	$1.1	$1.3	$1.4
telecommunications	$0.2	$0.3	$0.4	$0.5	$0.6	$0.7	$0.8
travel	$0.2	$0.3	$0.4	$0.5	$0.7	$0.8	$1.0
automotive	$0.2	$0.3	$0.5	$0.8	$1.1	$1.6	$2.1
health	$0.1	$0.2	$0.3	$0.4	$0.6	$0.7	$0.9
consumer packaged goods	$0.1	$0.1	$0.2	$0.4	$0.6	$0.8	$1.1
other	$0.7	$1.2	$1.8	$2.5	$3.1	$3.6	$3.9
total media spending	$3.2	$4.9	$6.6	$8.7	$10.9	$13.0	$15.0
classifieds listings	$0.3	$0.4	$0.6	$0.9	$1.0	$1.2	$1.4
total online advertising	$3.5	$5.3	$7.3	$9.5	$11.9	$14.3	$16.5

SOURCE: JUPITER COMMUNICATIONS, 2000



Web-Based E-mail Services

Web-based e-mail services are booming with 31% (169.9 million) of the world's total mailboxes. The top 10 providers for the fourth quarter of 1999 make up 83.3% of all Web-based mailboxes. MSN Hotmail (30.6%) and Yahoo! (27.7%) host more than half of the total Web-based mailboxes.

Web-Based E-mail Service	Number Of Mailboxes	Share
MSN Hotmail	52,000,000	30.6%
Yahoo! Mail	47,000,000	27.7%
Xoom SiteMail	10,000,000	5.9%
Lycos WhoWhere MailCity	9,500,000	5.6%
USA.Net Net@ddress	7,000,000	4.1%
Netscape WebMail	6,000,000	3.5%
Juno Online Services	2,960,000	1.7%
E-Trade	2,600,000	1.5%
Onebox.com	2,500,000	1.5%
Snap E-mail.com	2,000,000	1.2%
Other	25,000,000	14.7%

SOURCE: MESSAGING ONLINE, 2000

Mailboxes

Web-based mailboxes enjoyed the largest share of the world's total at the end of 1999 (31%), with ISP (Internet service provider) and VAN (value-added network) mailboxes coming in second (26%) and client/server mailboxes a close third (25%).

- **LAN Mail - 2%**
- **Host - 3%**
- **Client/Server - 25%**
- **ISP & VAN - 26%**
- **Web Mail - 31%**

SOURCE: MESSAGING ONLINE, 2000

Who's Going Online?

Closing The Demographic Gaps

Using the Internet was once a luxury for only the wealthy and educated members of American society. Now, Web use is becoming a part of everyday life for the masses.

It is creeping into the homes and offices of people of all demographics. It is breaking into the lifestyles of people in almost every country, age group, and socioeconomic level in the world. Although some demographic sections of the population are still underrepresented online, each year that passes, access to the Internet becomes easier to obtain.

Then & Now. Ten years ago, mostly only the smartest members of computer science departments at U.S. colleges logged on to Tim Berners-Lee's network of computers. Modems were extremely difficult to use, and most PCs did not have hard drives large enough to access the Internet and open Web sites.

In addition to a computer, an analog modem needs a phone line to connect to the Internet. A decade ago, anyone who wanted to get wired first had to have a telephone. Many people in second- and third-world nations did not have phones, and some still don't. For example, only 10 of every 100 people in Mexico have telephones, according to a 2000 study by eMarketer, an Internet marketing research firm.

Those who did have the hardware and connections necessary for Internet access still had to feel their way around the haphazard, English-only World Wide Web without the luxury of a portal site such as Yahoo!. Only those with much time and patience, and a good head for remembering URLs (universal resource locators; Web addresses), could do this.

That left only a slim minority of the U.S. population able to surf the Web. Anyone who wanted to experience the Internet in the early '90s had to have a telephone, a high-end computer, and someone smart enough to connect a modem to the two. (The person also had to have the patience of Job.) These criteria weeded out all but the educated and prosperous computer gurus with above-average incomes and a thirst for technology.

Today, this stereotype no longer holds true. With approximately half of the U.S. adult population online, the Internet's demographics are beginning to resemble the general population in the United States. Women, Asian-Americans, the uneducated, and children have flocked to the Web in droves lest they miss out on the Internet culture. "People want to expose themselves and their families to the Internet because of the fear of being left behind," says Claudine Thompson, an eMarketer analyst.

The Web still shuts out some demographic groups. The impoverished, the elderly, and minority groups other than Asian-Americans have not found it as easy to join the Internet crowd as others have. General disinterest and monetary constraints have kept these people offline. These underrepresented groups are making a comeback, though.

> **"They Said It..."**
>
> ***"I'm keeping the 'i' to remind us of what's really important—the Internet."***
>
> *-Steve Jobs, Apple iCEO, on changing the "i" in his title from interim to Internet, Macworld Expo, Jan. 5, 2000.*

The Internet is sweeping into schools, businesses, and public places. Computer hardware and Internet service prices have decreased. Because of these factors, Internet demographic analysts predict an online population that nearly mirrors the general population within only a few years.

How We Measured. The Internet community has no Census Bureau to gather statistics. Instead, a handful of private Internet research agencies do this. We gathered information from eight of these Internet research firms: The Computer Industry Almanac, eMarketer, Forrester Research, Global Reach, Jupiter Communications, Mediamark Research, Roper Starch Worldwide, and The Strategis Group.

Because each company's sample and definition of the online public are different, the information from company to company sometimes is contradictory. For example, Jupiter Communications defines the online population as those people two years old and older that have used the Web within the past 30 days. The Strategis Group, on the other hand, defines the online population as those 18 years old and older who have ever logged on to the Internet. However, even though there are some differences and we found that some individual statistics vary between studies, our overall findings were consistent from company to company.

We gathered information on both United States users and worldwide users, although we focus mainly on Americans. Our worldwide data serves to show how the online community in the United States compares to the online community worldwide.

Education One of the starkest distinctions between those people who are online and those offline is education. Web surfers are much more likely to have a college degree. "Educated individuals are more motivated to use the Internet to obtain information and communicate with each other," Thompson says.

According to Mediamark, in 1999, 40% of American Web surfers had a college education, but only 22% of the general population did. In addition, 21% of Web users had only a high school education in 1999, but 34% of the general population had only a high school education.

Newcomers to the Web seem to be undermining the unwritten education requirement for surfers, though. Many recent Web recruits are not college graduates. According to Roper Starch Worldwide, in 1999, only 30% of new surfers had at least a college diploma, and 37% of them have only a high school diploma.

The education levels of Web surfers are definitely starting to mirror the general population's education levels. Roper Starch

Worldwide reported that 37% of surfers new to the Internet in 1999 had only a high school diploma, and 37% of the general population also had only a high school diploma. In addition, 25% of new surfers in 1999 and 23% of the general population have attended some college classes.

■ **Income.** Even though education is an important barrier, yearly income remains the biggest dividing line between the haves and the have-nots. The average American household brings in $22,000 a year less than the average Web surfer's household, according to a 1999 study from Mediamark Research. The same study indicated the median income for wired households last year was $66,000, but the median income for U.S. households in general was only $44,000. If the Internet has left anyone behind, it is definitely the impoverished.

Those with incomes of more than $75,000 are 20 times more likely to be wired than those with lower incomes, according to a government study this year. In fact, according to Jupiter Communications, 15 million households generating $75,000-plus incomes will be online by the end of 2000. Jupiter Communications also reports this segment of the population will continue to be the largest online segment of the U.S. population until at least 2005.

In turn, these economic differences affect the Web demographics of other segments of society. For example, elderly people and some minority groups have average incomes that are less than the incomes of other groups. This fact helps maintain disparities in race and age demographic groups for Internet usage.

Fortunately, this disparity has begun to shrink. Youth from low-income households have begun accessing the Web from schools and public libraries. In addition, computer hardware and Internet service prices have gradually started to decline. "Cost will be less of a concern for lower income families as the costs of PCs and Internet access decrease," Thompson says.

As a result, the median household income of surfers has begun to more closely resemble the general population. According to Roper Starch Worldwide, in 1998, the median income of Internet newcomers in the United States was $53,000. In 1999, the median income of newcomers was $41,250.

■ **Age.** Although there is still a stark difference among income levels between online and offline Americans, age disparities have almost been erased. Every age group but the elderly seems to have jumped on the information superhighway. In 1999, the majority of those surfers were adults between the ages of 35 and 54, according to the Strategis Group. Although youth and elderly surfership is growing quickly, the adult majority probably won't go away any time soon.

Youth. Today's young people may not even remember life without the Internet. Some people speculate the Internet has become more popular than the telephone for this age group. This may be in part because chat rooms and other online communications mediums do not require an invitation, like telephone conversations do.

In addition, the wealth of information on the Web makes it a shoo-in as a popular resource for youth, whose temporary career is to get an education. Parents and teachers alike want those they look after to be as smart as possible, and what better way to do that than to introduce them to the Internet? Fifty-seven percent of parents who responded to a Roper Starch survey in 1999 said they went online, at least in part, to give their children Internet access. (*NOTE: To give you an idea of how prevalent Internet use is in education, in 1999, 87% of college students were online, according to eMarketer. This makes them the most likely demographic to have Internet access. With wired dormitories, easy access to computer labs, and a thirst for knowledge, universities provide a digital playground for the young.*)

Youth are definitely taking the Web by storm. In 1999, 28.2% of Web surfers in America were between the ages of one and 17, although the same age group accounts for only 25.7% of the general population, according to eMarketer. In 1999, 13 million teens (aged 13 to 18) and 14 million children (aged two to 12) had Internet access in the United States, according to Jupiter Communications. That's a combined 32% of all the teens and children in the country. In 2005, Jupiter predicts 68% of all teens and children in the United States will have online access.

Adults. In 1999, Mediamark Research estimated there were 198 million adults in the United States. Of this group, 98 million had Internet access, and most of these surfers were between the ages of 25 and 49.

This segment of America has easy access to the Internet, in part, because more and more businesses are taking advantage of broadband. The Strategis Group estimates 60% of Web users accessed the Internet at work in 1999.

Elderly. The elderly make up a small subset of the online population, especially when compared to their population in general. In 1999, those 55-years-old and older accounted for 11% of Web users in the United States, and 27% of

Today's young people may not even remember life without the Internet. Some people speculate the Internet has become more popular than the telephone for this age group.

the general population, according to Mediamark.

Those elderly individuals without Internet access live without it for a number of reasons. Many are uncomfortable using computers, and some do not have enough money to splurge on a PC and an ISP (Internet service provider). "There is just a population of seniors who will probably never go online because of technophobia and lack of interest," Thompson says.

The more time that goes by, the more elderly will log on to the Internet, though. Middle-aged people make up a huge segment of the online population, and they probably will continue to use the Web after they retire. "Seniors have the highest online growth projection" in the coming years, Thompson says.

By the end of 2000, Jupiter Communications predicts 5.6 million people older than 65 will be online. In addition, it predicts 17 million people age 50 to 64 will be online, even more than the number of wired college students (14 million). By 2005, Jupiter predicts 49 million people 50 years old and older will have Internet access. Even though that is more than half of the elderly population, it still leaves 36 million elderly without access, and less than half of the seniors older than 64.

■ **Gender.** The majority of the elderly may seem destined to remain offline, but women have proven just the opposite. Women's place online was small until just recently. In 1996, 58% of Web surfers in the United States were adult men, according to Mediamark Research. Traditionally, adult men have been more likely to enroll in computer technology classes and take technology jobs. "Men were the ones who created the Internet, so content was geared around men," Thompson says.

With less gender-bias in schools today, young women have become as interested in the Internet as young men. As those women grow up, they still access the Internet, making women's online presence bigger. "You'll see in the future that there will be more women online than men because so many teen-aged girls and girls that are children are online," Thompson says.

The Strategis Group reports 60% of new users in the United States in 1999 were women. At the end of 1999, 37.1 million adult women in the country were online, according to eMarketer. That means the U.S. adult online population at the end of the year was 49% women. This doesn't quite close the gap between online and offline population genders, as 52% of the general population is women, but it comes close.

eMarketer expects the number of adult female Web surfers will outnumber the number of male Internet users in the United States by 2002, in part because today's youth have grown up online and will probably continue to surf the Web as adults. In addition, more girls go online than boys.

As a result, we'll probably see more feminine-centric sites and online content in the next few years. We may see more shopping sites, coupon downloading, and mothering content, for example.

■ **Race.** As for race, American ethnic groups do not head for the Web in even percentages. Two-thirds of Asian-Americans go online today, but only one third of Hispanics and African-Americans do. By the end of 2000, eMarketer forecasts 74% of Asian-American households will have access to the Internet.

Why are Asian-Americans leading the Internet spree? Some say it is because the Asian culture focuses on computers and technology. Others say it is because Asian-Americans have the highest median household income, even among Caucasians. Asian-Americans in the United States make an average of $47,000 a year; Caucasians make only $41,000, according to an eMarketer study in 2000. Asian-Americans also have more people working under one roof, which causes a higher household income and a greater chance of connecting to the Internet. In addition, Asians are the most likely to have a college education. Forty-two percent of Asian-Americans have gone to college, as opposed to only 11% of Hispanics, according to eMarketer.

A slightly higher percentage of Hispanics have Internet access than African-Americans, according to the same eMarketer report. This could be because Hispanics in general are younger and therefore more enthused with technology. However, many African-Americans and Hispanics are too poor to own a PC so they must find access to it at a library or other public place. Jupiter Communications predicts that as minority income levels increase and the cost of a wired PC decrease, more and more African-Americans and Hispanics will go online. The company forecasts the number of African-American and Hispanic households that have Internet access will increase by at least 10% every year for the next five years.

According to a Jupiter study this year, only 4.0 million Asian-Americans have Web access, but 6.6 million African-Americans and 6.9 million Hispanics have access. The Asian-Americans number is lower because even though this group may have the best chance of getting wired, their slim population in general makes their presence online scarce.

Unfortunately, Native Americans do not have as easy of a time accessing the Internet. Thompson says that with only 22% of Native

They Said It...

"We are a cult in a way, but we're a customer cult, which isn't so bad. "

-Jeff Bezos, Amazon.com CEO, San Francisco Chronicle, Dec. 23, 1999.

Quick Tips

Typing Web address after Web address into your browser's address field is a tiring process, but you can speed it up. Most Web browsers default to "http://" so you rarely need to type this set of characters in. Even better, the later versions of most browsers also default to adding "www" before the main name and ".com" afterward so you can usually type ***companyname*** in your browser's address field to get to http://www.companyname.com. However, sometimes the browser will scan through all the domain name extensions before displaying the site.

Americans online, they account for only 420,000 users. This means only 1% of Americans online are Native Americans. "There's a strong correlation between income, education, and access," Thompson says. "Native Americans, unfortunately, have the lowest median income and the lowest educational attainment levels amortg all races" in the United States.

However, eMarketer's research shows Internet access is not totally determined by income. A child in a lower income Caucasian household in America is four times more likely to use the Internet than a child in a lower-income Hispanic household. "When you get to very low-income families, white families are more likely to be online just because there is more discussion about the Internet," Thompson says. In contrast, in families with household incomes greater than $90,000, the same percentage of African-American, Hispanic, and Caucasian families have online access. Even though income may dictate online access among the races, it isn't completely in control.

Another barrier to Internet use among ethnic groups is language. Many of America's ethnic groups speak English at work or at school but want to speak another language at home. They want access to the Internet in another language as well. The 1990 U.S. Census says 32 million Americans speak English during the day but switch to another language at night. Global Reach estimates that in 1999, 14.5 million Americans preferred to access the Web in another language than English. Those who speak a language not prevalent online are not likely to join the online community.

■ **Geography.** Non-English speaking countries did not start joining the online community until 1995 so they have a lot of catching up to do. Globally, the lower-income regions have sparse online access. Those born in impoverished third-world countries may never hear the word "Internet." According to the Computer Industry Almanac, only eight of every 1,000 people in the Middle East and Africa had access to the Internet in 1999, but 493 of every 1,000 Americans did. Of the 190 countries recognized by the U.S. State Department in 1999, 15 accounted for 82% of all Web traffic in the world, according to the Computer Industry Almanac.

Despite this, the United States' dominance online is fading. The Computer Industry Almanac reports that in 1995, North Americans accounted for 69% of the online population at 31 million users. Today, North America accounts for less than half of the Web population with only 43% of the world's users. In 2005, the Computer Industry Almanac predicts that North America's 232 million users will account for only 30% of the world's online population. Western Europe's 214 million, in comparison, will contribute 28% of the world's users.

They Said It...

"In the end, the Internet itself will not be able to survive if it becomes a haven for illegal activity. Copyrights must be protected online."

-Edgar Bronfman, Seagram CEO, Los Angeles Times, July 17, 2000.

Central and South America. In contrast, Central and South American Internet users will make up only 5% of the 372 million Web surfers by 2003, according to eMarketer 2000. The Internet infrastructure there is difficult because of the lack of phone lines, the great expense to implement it, and the lack of Spanish and Portuguese sites. With nearly two-dozen countries, three nations make up approximately 80% of Internet users in the region today.

Even in those countries—Argentina, Brazil, and Mexico—Internet use is a novelty because of a lack of telephone lines. According to eMarketer report in 2000, Brazilians have only 11 telephones per 100 people, and Mexicans have only 10 phones per 100 people. Even by 2003, only 4.5% of Mexico's population will have Internet access, according to eMarketer.

Asia. Japan and China are forging the way for online Asians. China, especially, seems to have the most potential for widespread Internet use in the near future. Even though it is the world's most populated country with more than a billion people, China had only 12 million Internet users in 1999, according to the Strategis Group. That's only one out of every 200 people. This gives China a lot of room to grow.

Already, China is the fastest growing Internet market in Asia and will be one of the world's biggest markets within the next few years. It will grow at 66% yearly during the next five years, according to a Strategis Group study in 2000. "The Internet is more available to people of Chinese residency [in part] because of a relaxing of the political constraints in China," Thompson says.

In addition, the recent availability of wireless Internet access has generated many Web users throughout the continent. "Wireless access is huge in Asia," Thompson says. Forty percent of the people in Japan own a mobile phone, and 40% of Japanese people have access to the Internet, according to an eMarketer report in 2000.

Europe. European countries are not closing the digital divide as quickly as the United States is, but they seem to have less of a divide to close. Although European males outnumber European females online three to one, the average surfer's income closely resembles the average income of Europeans in general.

In the United Kingdom, however, wired Britons are mostly upper and middle class. Even in Britain, though, the working class is starting to show up more and more online. According to Forrester Research, in 1998, 86% of British surfers were upper or middle class. In 2000, only 74% of British surfers are upper or middle class

The British also have a high concentration of young Web surfers. Half of the youth in the United Kingdom aged 15 to 24 go online; this number is up from 30% last year according to a Forrester Research report in 2000.

■ **Typecasting The Internet.** The Web's demographic information is crucial to online marketers and Web sites. They must know who is online if they want to be able to reach their target audiences. For example, you don't see many online advertisements or content for Native Americans because marketers know from Web demographic research that few Native Americans are online. "Why should I invest in an online business if I don't know that I'll be able to target my niche market?" Thompson asks. RS

by Michelle Nelson

Online Demographics

What do the hundreds of millions of people who go online have in common? Not as much as they used to. Although American men were once the main online audience, women, minorities, youth, and non-Americans are quickly closing the gap between the surfers and the surf-nots.

Online Buyer Profile

Of English-speaking online spenders, Brits are the youngest and wealthiest of the bunch. They also are more likely to be male and single than the other English-speaking buyers. (NOTE: All of the incomes below are in U.S. dollars.)

American: American online shoppers have a median age of 41 and a median household income of $59,000. There is a 58% chance each shopper is married and a 41% chance each person graduated from college. In addition, 50% of American shoppers are male.

Australian: Australian online shoppers have a median age of 37.9 and a median household income of $62,300. The probability that an Aussie shopper is male is 59%. These shoppers also have a 63% likelihood of being married and a 58% likelihood of having a college degree.

British: British online shoppers have a median age of 36.7 and a median household income of $64,600. Sixty-nine percent of all are male, too. In addition, 51% of all British online shoppers are married and 56% have a college degree.

Canadian: A Canadian online shopper has a median age of 41.7 and a median household income of $59,000. Of all the Canadian online shoppers, 66% are married and 48% have graduated from college. In addition, there is a 63% chance the shopper is male.

Source: Ernst & Young, 2000

The Virtual vs. The Actual American

The wired American continues to enjoy a better lifestyle than his unwired counterpart, but the digital divide has recently begun to narrow.

Typical American: Her median age is 35.2, and her median household income is $36,000. There is a 51% chance she is a female, a 73% chance she is not a college graduate, and a 59% chance she is married.

Source: U.S. Census, 1998

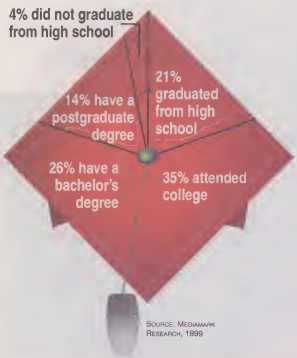
Online American: His median age is 38, and his median household income is $57,000. There is a 51% chance he is a male, a 58% chance he is a college graduate, and a 45% chance he is married.

Source: eMarketer, 1998, 2000

Education Levels

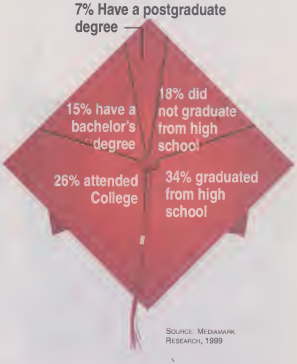
A whopping 40% of adult Web users in America have at least a bachelor's degree, and 75% have at least attended college. In contrast, only 22% of the general adult population has at least a bachelor's degree, and only 48% have even attended college.

U.S. Web Surfing Population


4% did not graduate from high school
21% graduated from high school
14% have a postgraduate degree
26% have a bachelor's degree
35% attended college

SOURCE: MEDIAMARK RESEARCH, 1999

General U.S. Population


7% Have a postgraduate degree
18% did not graduate from high school
15% have a bachelor's degree
34% graduated from high school
26% attended College

SOURCE: MEDIAMARK RESEARCH, 1999

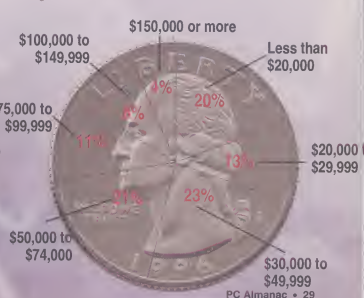
Household Income Levels

Most American wired households make more than $50,000 a year, and the average income is $65,778 per year, according to a Mediamark Research in 1999. With a median income of $44,038, American households that are not online earn only 66% of what those that are online earn.

U.S. Surfers

SOURCE: MEDIAMARK RESEARCH, 1999

General U.S. Population



Occupations

More Web surfers, 37%, are in the professional or managerial fields than are in any other field. In contrast, 20% of the general population is in the professional or managerial fields. In addition, a large portion, 35%, of the general population is in the not employed or retired fields and only 18% of the Web surfers fall into these categories.

Key

A = Not Employed, Retired
B = Craft, Precision Production
C = Technical, Clerical, Sales
D = Professional, Manager
E = Other

U.S. Web Surfers

General U.S. Population

SOURCE: MEDIAMARK RESEARCH, 1999

U.S. Wired Households & Businesses

The Internet is creeping into households much faster than in businesses. In the next four years, the Strategis Group expects the number of households with Internet access to nearly double.

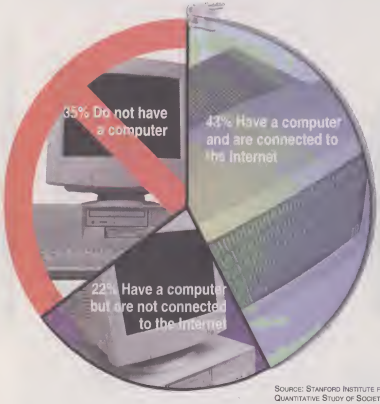
Online Households

Online Businesses

SOURCE: STRATEGIS GROUP, 2000

Internet Connected U.S. Households

Today, almost a quarter of the households in America have computers without Internet access. However, 43% of households have a computer and an Internet connection.


35% Do not have a computer
43% Have a computer and are connected to the Internet
22% Have a computer but are not connected to the Internet

SOURCE: STANFORD INSTITUTE FOR THE QUANTITATIVE STUDY OF SOCIETY, 2000

U.S. Web Surfers By Age

Approximately one in seven people online is 12 years old or younger, and one in three is between the ages of 35 and 54. That's a lot of 40-somethings out there surfing.

SOURCE: EMARKETER, 1999

Marital Status

The vast majority of adult Web users in the United States are married. Only a small percentage of surfers are divorced. Even though the marital status of the general U.S. population closely mirrors that of the online population, the general masses are more likely to be divorced.

Online Visitors

SOURCE: MEDIAMARK RESEARCH, 1999

General Public

SOURCE: MEDIAMARK RESEARCH, 1999

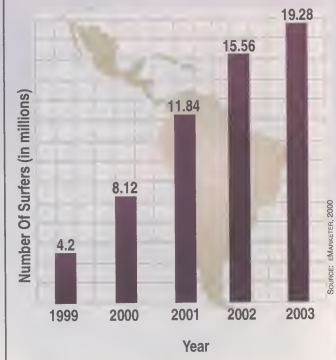
Online Youth

Children's use of the Internet is about to skyrocket, with the percentage of American children between the age of two and 12 with online access at home or in public almost doubling by 2005. By the end of 2000, this same age group will outnumber teens and college students online in the United States.

SOURCE: JUPITER, 2000

Latin-American Surfers

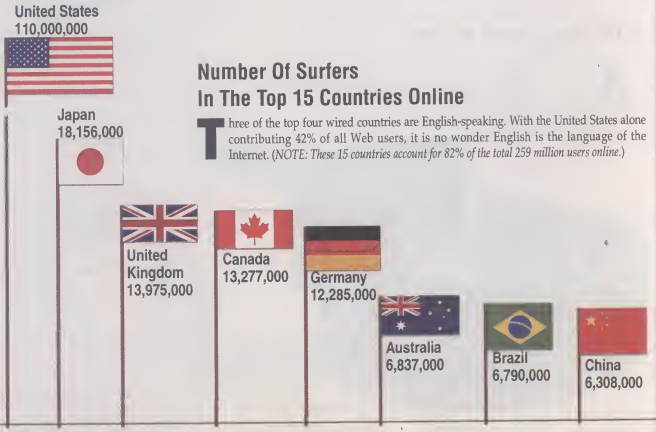
The Latin-American online population is growing substantially each year. By 2003, there should be 19.28 million Latin-Americans online.



SOURCE: EMARKETER, 2000

Number Of Surfers In The Top 15 Countries Online

Three of the top four wired countries are English-speaking. With the United States alone contributing 42% of all Web users, it is no wonder English is the language of the Internet. (*NOTE: These 15 countries account for 82% of the total 259 million users online.*)



SOURCE: COMPUTER INDUSTRY ALMANAC, 1999

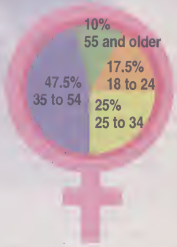
Moms Online

The increase in online mothers in America has resulted in an increase in children online. The number of online moms has almost quadrupled since 1997.

SOURCE: GRUNSWALD ASSOCIATES, 2000

Composition Of Women On The Web

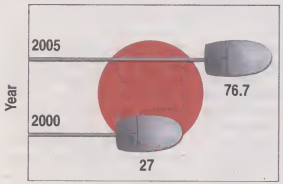
Like the general online population, the majority of adult women online in the United States are between the ages of 35 and 54.



SOURCE: MEDIA METRIX, 2000

Japanese Surfers

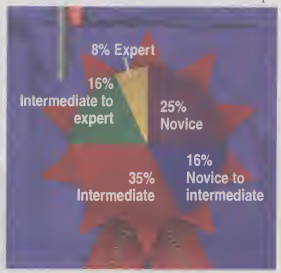
Although some wager that China's Internet user base will expand faster than any other Asian market, others look to Japan's online population to boom even faster.



SOURCE: JAPANESE GOVERNMENT, MINISTRY OF POSTS AND TELECOMMUNICATIONS, 2000

Tech-Savvy Surfers

When asked to rate their own online abilities, only a few Web users dubbed themselves as gumshoe surfers. Roper Starch contacted 1,000 randomly selected households with Internet connections and asked the residents to rank their technical expertise.



SOURCE: AMERICA ONLINE/ROPER STARCH CYBERSTUDY, 1999

What Are You *Doing?*

Online Surfing Habits Remain Similar Across Demographic Boundaries

In the previous article on who's online, we analyzed what exactly constitutes the digital divide. We discovered who goes online and how those numbers change as we go from one demographic to another.

Now we take a look at *why* people go online. What do people do once they have access to the biggest, most open source of communication, information, merchandise, and entertainment available? How do people use such freedom?

When we delved into this topic, we found that once people get online, they all use it for mostly the same reasons. There may be a digital divide of who has access in the first place, but there the demographic segregations end.

Sure, there are some segments of surfers who do more of one activity than another segment, or perhaps they spend less time online in general. For the most part, however, you're probably doing what everyone else who logs on to the Internet is doing.

What's more, these activities closely resemble society's offline activities. "There is a parallel social and economic structure with online alternatives for shopping, entertainment, investing, and communicating," says Guss Schattenberg, vice president for global research at Angus Reid, a company that tracks and analyzes Internet demographics and user habits. What goes on in reality goes on online.

For the most part, research firms agree that communication is the No. 1 use of the Internet today, followed by information, then entertainment and e-commerce. These uses continue to be popular as the Internet becomes more of a product for the mass public.

■ **Top Activities.** Most people connect to the Internet for more than one activity. Schattenberg says, "The Internet serves multiple functions for users. It's an information and communication medium as well as an entertainment medium."

This year the SIQSS (Stanford Institute for the Quantitative Study of Society), a research team on social changes at Stanford University, found that most surfers do more than five different activities, such as online banking, communicating, or researching. The more years a person has spent online, the more activities he or she engages in. Those who have been on-line more than five years average nine different activities.

Web surfers log on mostly to communicate or do research, a number of studies have found. People in all age groups, ethnicities, and economic levels spend time sending e-mail and finding information.

Most age groups spend time doing the same types of things for the same amounts of time. However, there are a few exceptions. Those ages 65 and older do not spend as many hours online as those surfers who are younger. Younger age groups, however, spend nearly equal amounts of time online.

E-mail, news, research, and a few other topics are popular among all ages. However, youth are more likely to head for chat rooms and music downloading sites than their elders. Chat room visitors are almost entirely 20-somethings and teen-agers.

■ **Communication.** Most people log on to communicate, numerous studies have found. According to Forrester Research, an Internet demographics and use analyzer, two-thirds of the online community uses the Web primarily for communication. Youth head for chat rooms, adults swap e-mails, and Canadians engage in voice chatting, according to Media Metrix.

Dates To Remember

In January 1993, Marc Andreessen of Netscape fame launched Mosaic for X. This was the first graphics-mode browser that let individuals access the Internet.

More than a third of U.S. Internet surfers communicate in chat rooms, but youth are more likely to head for chat rooms than their elders, according to the results of a 2000 SIQSS study. Those who reach age 25 are unlikely to use chat rooms, and few people over the age of 30 visit them.

As for e-mail, about 88% of Web users head online to swap messages with friends and family, according to a 1999 Roper Starch Worldwide survey. Roper Starch is a media research company that specializes in Internet topics. About 48% of U.S. surfers communicate with colleagues via e-mail. And 29% of those who travel for business check their e-mail while 24% of those traveling for pleasure check it.

In many cases, people seem to prefer online communication to traditional forms of

People in all age groups, ethnicities, and economic levels spend time sending e-mail and finding information.

communication. Schattenberg says this is because e-mail is faster, worldwide, and cost-efficient. "In many countries, [e-mail] has a tremendous advantage over expensive and unreliable local telephone and postal services," he says.

Interestingly enough, Canadians are far more likely than Americans to use voice chat capabilities. In Canada, 41% of the population now has the ability to verbally chat with others online, according to Media Metrix.

The Web contains numerous other types of communication, such as bulletin boards and instant messaging. Roper Starch Worldwide found that 56% of U.S. surfers communicated with others using instant messages in 1999, compared to 36% who chat. As for ICQ (I Seek You, an online chatting program) messages, digital media measurement firm Media Metrix found in June 1999 that 8% of ICQ users are younger than 12 years old and 26% are younger than 18.

News. Many Web surfers have found that online news is more up-to-date and easier to read than a newspaper. They favor it over the evening news because they do not have to sit through the news they are not interested in, and they can find out more information about their locale.

The Web has attracted so many news-seekers that newspapers and television may have reason for concern. SIQSS found this year that even those users who surf the Web for less than an hour weekly report a decrease in newspaper reading, and 34% of those who spend more than six hours online read newspapers less than they did before they became Internet surfers.

Some studies have shown that traditional news mediums have little to fear, though. Many surfers now use numerous sources of information to get their periodic news fix. Internet news may be up-to-date and easy to sort through, but people often head for television and newspapers for local happenings. Also, many newspapers are complementing their print versions with online versions. "The lines are beginning to blur, as traditional media get their own Web sites to make sure they follow their readers into the new medium," Schattenberg says.

Travel. The travel industry also has experienced a surge in online popularity. Vacationers flock to the Web to research destinations and accommodations. With photos, contact information, and news, the Internet has become the place to discover a travel destination. Nearly 35% of U.S. surfers book some sort of travel reservations on-line, and many more research them, according to a 1999 Roper Starch Worldwide study.

While travel sites would like visitors to book vacations and reservations online, most surfers merely research their options. They find information online and then log off to make a phone call. Internet users explain their actions in a variety of ways. Many say they do not feel 100% assured that their reservation is booked when they make the reservation online. They need to hear an actual voice tell them they have a reservation. Others say a travel agent is a more personable means of making reservations. Most say they can get cheaper prices offline.

Just the Facts!

About 86% of Internet users wish to protect their online privacy; 54% of Internet users have provided personal information online; and 48% of Internet users have used a credit card to shop online. (Source: Pew Internet & American Life Project, Aug. 20, 2000)

They Said It...

"This isn't just about a bunch of kids stealing music. It's about an assault on everything that constitutes the cultural expression of our society."

-Richard Parsons, president of Time Warner, on the use of software to download music from the Internet, Los Angeles Times, July 17, 2000.

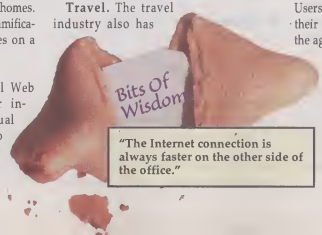
Some worry that these new forms of electronic communication may intrude upon other traditional forms of communication. A study this year by SIQSS found that 15% of surfers who spend at least 10 hours a week online spend less time socializing. And 25% of those surfers spend less time on the telephone calling friends and family. This may be because the Internet connection is tying up the use of the single phone lines installed in most homes. Regardless, no one knows what the ramifications will be of a society that relies on a digital medium to communicate.

■ **Information.** Almost all Web surfers use the Web to gather information. The Internet is a virtual public library, with no late fees. Two of the biggest information items sought are news and travel information.

■ **E-commerce.** It's no surprise that each season, Internet commerce becomes more profitable. Angus Reid reports that e-commerce revenues will reach $4.1 billion in 2000, more than double 1999's figure. Shopping online has become a craze among users, as they can find almost anything and everything, then bargain shop for it without leaving home.

Different demographic groups frequent the various avenues of e-commerce more often, according to Roper Starch Worldwide (1999). Users older than 50 are most likely to track their stock portfolios online. Users between the ages of 25 and 34 are most likely to make online purchases.

Shopping. Merchants have been creating shopping sites for a few years now, and their use is finally becoming widespread. About 42% of U.S. surfers make online purchases, according to a 1999 report from Roper Starch Worldwide.



"The Internet connection is always faster on the other side of the office."

Quick Tips

Always use more than one search engine when doing research. Different search sites rely on different search engines to sort their data, so you may get different results. Because of the size of the Internet and the rate at which it changes, it's also unlikely that two search sites have all the same pages indexed.

Much like online travel researchers, many online shoppers do not buy anything. "We suspect that much of the online information gathering is the electronic equivalent of window shopping," Schattenberg says. People want to look around and buy later.

Americans who research but do not buy seem mainly worried about security issues or buying a product they haven't touched. People are uncomfortable typing their credit card number into a World Wide Web they do not fully understand. They also prefer to see or try some things on before they purchase them, says Schattenberg.

Some segments of society do not make online purchases because they do not have a credit card to do so. For the most part, e-commerce merchants do not accept cash or written checks. Those without a credit card, including youngsters and low-income households, are out of luck.

The credit card barrier keeps many non-Americans from making online purchases as well. "Many people in Asia and Latin America don't have credit cards and have to use other means of payment that are very time-consuming," Schattenberg says. EMarketer, an Internet research firm, this year found that only 18% of Brazilians and 22% of Mexicans have credit cards.

Another reason Latin Americans may not buy online as much is that surfers in those countries tend to be younger as a whole than Internet users in other regions, and they are therefore less likely to have money or means to make purchases. As a result, Latin America will only contribute 1% of the world's $1.4 trillion e-commerce revenue in 2003, according to eMarketer.

In addition, most e-commerce sites are United States-based. Often, they are written in English, take only American credit cards, and ship only to U.S. locations. Also, many countries impose high tariffs on U.S. imports or have high shipping costs. While 39 million Americans shopped online in 1999, only 8.3 million Europeans did.

Canada is one of the few countries that enjoys the ability to buy U.S. goods online, thanks to easy shipping across the borders. Canadians have also begun thriving with their own Canadian-based e-commerce market, according to a recent study by Angus Reid. About 25% of Canadian retailers have a Web site, more than half of which offer online shopping. Among the 75% of Canadian merchants that do not have a Web site, 40% say they will have one within the near future.

As for gender, a recent study by Roper Starch Worldwide indicates that 37% of women sometimes make online purchases while 46% of men do. This may be because men have been online longer than women have, and online purchasing seems to increase with the length of time a person has been online.

As e-commerce popularity grows, it has some effects on other segments of society. For example, this year, SIQSS found that non-working surfers spend less time in actual stores and therefore, less time driving. Among those who spend 10 or more hours online a week, 29% spend less time in traffic and 21% shop less in stores. This does not seem to affect the working population.

Finance. Along with online shopping, users are also going online to take care of finances. Banking and investing are the two most popular activities.

Investing. Online investing has enjoyed much the same fate as e-commerce. The lure of striking it rich via online trading resembles the gold rush, and many people are trying it out. Online brokers have made buying and selling stocks as easy as buying online merchandise, offering as much information about specific companies and funds as they can so individuals can make decisions on their own.

Veteran stockowners like the ability to make instant transactions online instead of having to schedule distant appointments with a broker to do so. Newcomers like online trading because they can invest relatively small amounts.

These factors make online investing much like a strategic game that almost everyone wants to play. Unlike the trial-and-error attempts to dig up gold, those who want to hit the mother lode must trust more than their intuition. They can research companies and their stocks and act accordingly. They can be as cautious or as reckless as they wish.

In 1999, 35% of surfers in the United States had tracked their stocks and 14% had actually traded stocks. In 1998, only 11% of U.S. users traded stocks, according to a 1999 Roper Starch Worldwide report. While these figures may not seem like a lot, those percentages include all U.S. Web surfers, not just those with the money available to play the stock market. "Only a small proportion of the population is either affluent or financially sophisticated enough to be drawn to online trading," Schattenberg says.

Schattenberg says there will continue to be those who would rather invest offline, through an in-person broker. "It depends on whether investors feel sufficiently 'bullish' to venture out on their own," he says.

Banking. Americans seem much more eager to play the stock market online than they do to meddle with their bank accounts. While online investing has blossomed, online banking has held steady. More people bank online than trade stocks, but then again, more people have bank accounts than have stock portfolios.

GUESS WHO?

This inquisitive inventor put together his first computer using a soldering iron, a basic processor, and an old TV. He later created HTML (Hypertext Markup Language), the code behind the World Wide Web.

Answer: Tim Berners-Lee

Only 17% of all American surfers banked online last year, and that number has not increased all that rapidly. Only 1% more people banked online in 1999 than did in 1998, according to a 1999 Roper Starch Worldwide report. However, Angus Reid says that 21% of U.S. surfers will try online banking by next summer, and eMarketer estimates that 14.5 million Americans will bank online by 2002.

Those in many foreign countries have been much more willing to try online banking. About 46% of South African Internet users will bank online within the next year, according to a 2000 Angus Reid report. Schattenberg says this may be because the American banking infrastructure is much more fragmented. Other countries may have only one or two large banks that con-trol the financial sector, while the United States has dozens. "Banking markets over-seas are often dominated by a few large banks that are making a concerted effort to move their customers online," Schattenberg says.

Entertainment. Many Internet users are becoming increasingly attracted to the entertainment side of the Web. As online technologies expand and become easier to use, surfers can do more things. Among the most popular entertainment venues are listening to music and playing games.

Music. The online music segment is one of few industries that enjoy a fairly specific fan base, at least in the United States. Most American surfers who listen to music online are in their early 20s or younger. About 61% of online users between the ages of 18 and 24 listen to music online while only 22% of those users ages 50 and older do, according to a 1999 Roper Starch Worldwide study. Schattenberg says this is because music downloading and sampling in America has become an "age delineated mass market" that caters to youth.

> **They Said It...**
>
> ***"We're only at the start of the dot-com learning curve. As the road gets steeper and you don't drive at Internet speed, you'd better keep an eye out for the tire marks on your back."***
>
> *-Scott McNealy,*
> *Sun Microsystems CEO, The Register, April 12, 2000.*

In other countries, however, all age groups enjoy using the Internet as a music medium. Angus Reid found that online music sampling and downloading is popular with all age groups in South America, Asia, and many parts of Europe. "It's their window on worldwide trends and new music that may not have reached their local retailer," Schattenberg says.

Games. While music sites can cater to youngsters in the United States, gaming sites have a much broader consumer base. Almost every age group, from teenagers to seniors, likes to play online games. While young people spend more time than older people at this activity, it is still prevalent among all ages throughout the world. About 62% of young adults play games and 41% of those 50 years and older play games.

Lifestyle. As online usage increases, daily life in the United States changes. The more time people spend online, the more their offline habits also change. "The Web is gradually becoming integrated into the fabric of everyday life," Schattenberg says.

The longer a person has been online, the more time per week he or she surfs, according to SIQSS. As more and more people join the online community and begin to feel comfortable online, we will become an even more Web-reliant society.

Among other ramifications, this means we will spend less time watching television. This year, SIQSS found that among users who spend between one and five hours online a week, 43% watch less television than they did before they joined the online world. And 65% of those polled who spend more than 10 hours online a week watch less television than they did before they joined the Internet population.

Also, those who go online are becoming more and more likely to bring work home with them. SIQSS found that 15% of part-time and full-time workers report that they do more work at home now that they have a home Internet connection. This would seem to suggest a trend in telecommuting, but studies have not found that to be true. Those who bring work home with them do not seem to work less at the office. Schattenberg says that many workers "may find that being away from the office isolates them too much from their colleagues." Many workers say that since they have gone online, they have started working more hours both at the office and at home.

As to where people access the Internet, 38% of the U.S. population has Internet access at home; 17% access it elsewhere, either at work or at a public location such as a library; and 45% still has no access at all, according to SIQSS.

Regardless of where they access the Internet, Web users seem to engage in the same activities. As the digital divide closes and more and more people join the online community, Internet usage habits more closely mirror offline activities. The main difference is that online, you can be anonymous. RS

by Michelle Nelson

Do You Know...

how much money businesses will lose this year alone due to computer viruses and hackers?

According to PricewaterhouseCoopers, computer downtime as a result of Internet-related security issues will cost businesses around the world $1.6 trillion and 40,000 person years of productivity. A person year is the amount of work one person can do working 24 hours per day, 365 days per year.

What People Do Online

It seems like human nature to peer into other people's lives. We open bathroom medicine cabinets at dinner parties. We send paparazzi to take snapshots of celebrities on their vacations. We are a nosy species.

That said, you've probably wondered what everyone does online. Who shops? Who downloads music? Who books vacations on the Web? You know what you do. What do your peers do?

Top Online Activities

Roper Starch Worldwide researched what percentage of surfers engages in the various types of activities online. More activities became more popular than less popular, showing that people in general used the Web for a bigger variety of things in 1999 than they did in 1998.

Research:	**1999:**	**92%**
	1998:	91%
Communicate with friends and family:	**1999:**	**88%**
	1998:	87%
Get information about products to buy:	**1999:**	**73%**
	1998:	71%
Get news:	**1999:**	**70%**
	1998:	72%
Send and receive instant messages:	**1999:**	**56%**
	1998:	52%
Get local entertainment information:	**1999:**	**50%**
	1998:	48%
Communicate with business associates:	**1999:**	**48%**
	1998:	47%
Get sports information:	**1999:**	**46%**
	1998:	44%
Play games:	**1999:**	**44%**
	1998:	**Unavailable**
Make purchases:	**1999:**	**42%**
	1998:	31%
Chat:	**1999:**	**36%**
	1998:	33%
Book travel reservations:	**1999:**	**35%**
	1998:	32%
Track stock portfolios:	**1999:**	**35%**
	1998:	32%
Listen to music:	**1999:**	**31%**
	1998:	**Unavailable**
Meet people with common interests:	**1999:**	**22%**
	1998:	27%
Bank online:	**1999:**	**17%**
	1998:	16%
Trade stocks:	**1999:**	**14%**
	1998:	11%

Source: Roper Starch Worldwide, November 1999

Interest In Automobile Internet Access

Perhaps the only thing keeping the Web out of cars is price. One study shows that half of Americans would favor Internet access in their cars if it cost $5 a month or less.

Price Americans Are Willing To Pay:

Source: CNW Marketing Research, March 1999

Compiled By Michelle Nelson
Graphics & Design By Andria Schultz and Carrie Benes

Top Online Activities By Age Group

Young people listen to music and older people trade stock. Almost half of everyone polled plays games online.

Play Games:

18- to 24-year-olds: **62%**
25- to 34-year-olds: **44%**
35- to 49-year-olds: **42%**
50 years and older: **41%**

Make Purchases:

18- to 24-year-olds: **41%**
25- to 34-year-olds: **51%**
35- to 49-year-olds: **42%**
50 years and older: **36%**

Track Stock Portfolios:

18- to 24-year-olds: **23%**
25- to 34-year-olds: **32%**
35- to 49-year-olds: **36%**
50 years and older: **41%**

Listen To Music:

18- to 24-year-olds: **61%**
25- to 34-year-olds: **33%**
35- to 49-year-olds: **26%**
50 years and older: **22%**

Bank Online:

18- to 24-year-olds: **12%**
25- to 34-year-olds: **22%**
35- to 49-year-olds: **18%**
50 years and older: **14%**

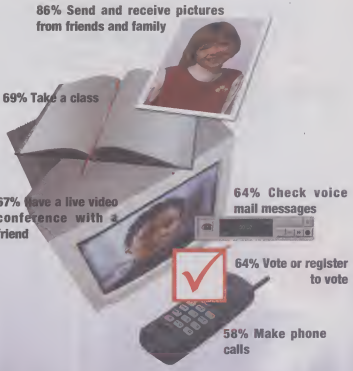
Trade Stocks:

18- to 24-year-olds: **6%**
25- to 34-year-olds: **15%**
35- to 49-year-olds: **16%**
50 years and older: **14%**

SOURCE: ROPER STARCH WORLDWIDE, NOVEMBER 1999

New Internet Technology

Most people are interested in new Web technologies. These percentages include those who already engage in the activities and those who are interested in them but have not tried them.

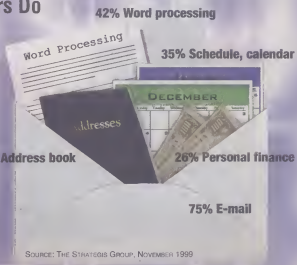

86% Send and receive pictures from friends and family
69% Take a class
67% Have a live video conference with a friend
64% Check voice mail messages
64% Vote or register to vote
58% Make phone calls

Receive and pay household bills:	**55%**
File or pay income taxes:	**53%**
Download music:	**51%**
Go online using a television:	**45%**
Buy tickets to movies:	**43%**
Go online using a handheld device or phone:	**41%**

SOURCE: ROPER STARCH WORLDWIDE, NOVEMBER 1999

What Wireless Users Do

While American wireless users spend much of their time swapping e-mail, many also use these devices for offline applications.



SOURCE: THE STRATEGIS GROUP, NOVEMBER 1999

Top Buying Categories Worldwide

Most online buyers are looking for computer products, books, or CDs in the top e-commerce countries.

Australia

Number	Product
1	Books
2	Computers
3	CDs
4	Investments
5	Air travel

Italy

Number	Product
1	Books
2	Computers
3	CDs
4	Hotel reservations
5	Air travel

Canada

Number	Product
1	Computers
2	Books
3	CDs
4	Women's clothing
5	Electronics

United Kingdom

Number	Product
1	Books
2	CDs
3	Computers
4	Air travel
5	Videos

France

Number	Product
1	Computers
2	CDs
3	Books
4	Air travel
5	Hotel reservations

United States

Number	Product
1	Computers
2	Books
3	CDs
4	Electronics
5	Toys

Source: Ernst & Young, January 2000

Worldwide Online Purchases

Of those people who shop online, most make multiple purchases. The number of purchases per country is similar to the percentage of Internet users who shop online. Numbers are in number of purchases per year per household that shops online.

Source: Ernst & Young, January 2000

Worldwide Online Spending

Of those who shop online, most spend more than $800 a year in the top e-commerce countries. Ironically, French buyers spend almost as much as American buyers online, but they make less than half the number of purchases.

SOURCE: ERNST & YOUNG, JANUARY 2000

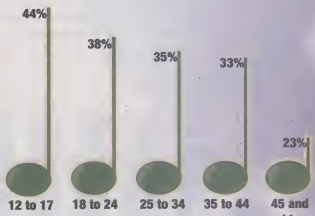
Top States In Online Spending

California spent almost twice the money online than any other state spent in 1999, and 142 times as much as Wyoming. Wyoming residents spent $41.5 million online; the least of any U.S. state. Note the top-spending states are also the most populated.

SOURCE: INTERNATIONAL DATA CORPORATION, FEBRUARY 2000

Percentage Of Music Downloaders By Age

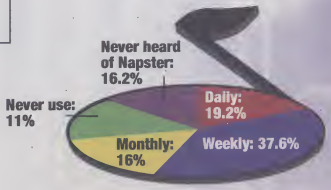
Although not the most prevalent online population in general, teen-agers worldwide download the most music.



SOURCE: ANGUS REID, JUNE 2000

College Students On Napster

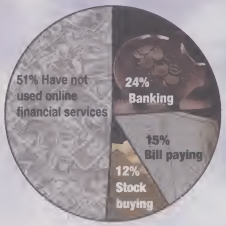
Many college students have broadband Internet access in their dorm rooms and a love of music, which makes downloading songs almost come naturally for them. More than three-quarters of college students polled have downloaded music from Napster.



SOURCE: WEBNOZE RESEARCH, JUNE 2000

Online Financial Services Sought

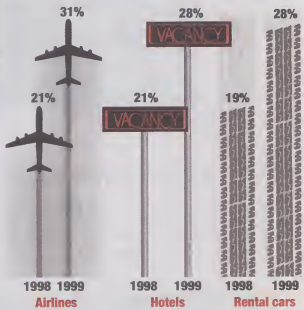
A little more than half of wired Americans have taken advantage of an online financial service, but only about one in eight buys stocks on the Internet.



SOURCE: THE STRATEGIS GROUP, NOVEMBER 1999

Travel Site Visitors Who Make Reservations Online

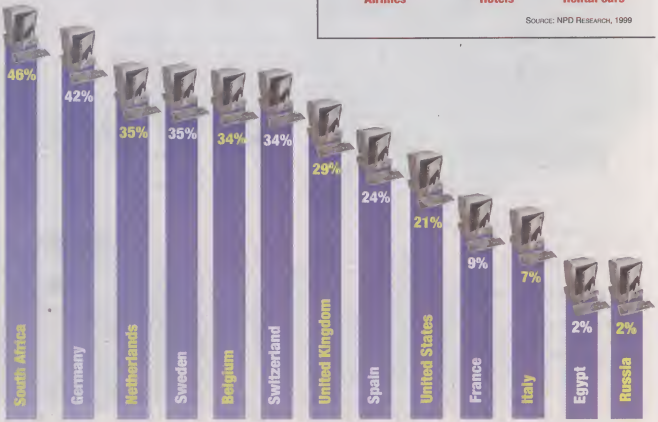
Most travelers who research their destinations and transportation mediums do not book reservations online, but the numbers are increasing. Here are the percentages of people who research and book these items online:



SOURCE: NPD RESEARCH, 1999

Percentage Of Web Users Who Will Bank Online In The Next Year

Almost half of South African surfers will bank online within the next year, while only one in 50 Russians will.

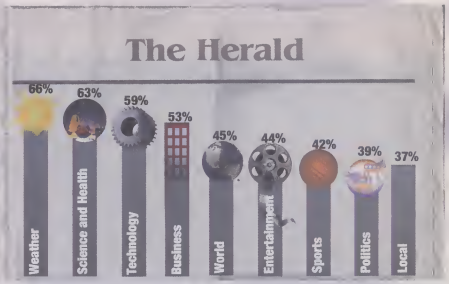


SOURCE: ANGUS REID, JUNE 2000

Most Popular Topics For Online News

Americans have a preoccupation about the weather, and the best place to find up-to-the-minute information about it, they have found, is the Internet. Two-thirds of news fiends read weather forecasts online.

SOURCE: THE PEW RESEARCH CENTER, JUNE 2000



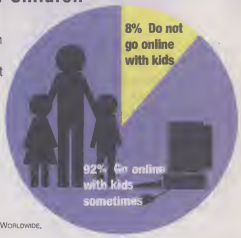
Spouses Who Go Online Together

The majority of married couples spend time sitting together surfing the Web.

SOURCE: ROPER STARCH WORLDWIDE, NOVEMBER 1999

Parents Who Go Online With Their Children

Most parents with children sit with their kids to surf the Internet every now and then.



SOURCE: ROPER STARCH WORLDWIDE, NOVEMBER 1999

Home vs. Work Surfing

Those who connect to the Web at work surf more often and longer than those who visit the Internet at home. In addition, work users view more than twice as many Web sites.

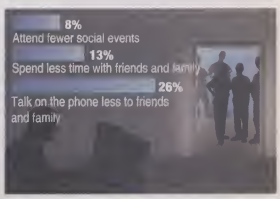
Work: The average Internet user surfs 11 times a week for 31 minutes per session, viewing 12 sites and 35 Web pages each time.

Home: The average Internet user surfs six times a week for 30 minutes, 25 seconds each session, viewing six sites and 36 Web pages each time.

SOURCE: NIELSEN//NETRATINGS, JUNE 2000

Web vs. Social Activities

The Stanford Institute for the Quantitative Study of Society polled a group of people who spent at least five hours online weekly and found that avid surfers spend less time socializing.



SOURCE: STANFORD INSTITUTE FOR THE QUANTITATIVE STUDY OF SOCIETY AT STANFORD UNIVERSITY, FEBRUARY 2000

backlink—A feature built into the Hyper-G Web publishing system that lets you find all the Web pages that link to your Web page. Using backlinks without Hyper-G involves adding special scripts to your Web page or checking the searchable index of a search engine such as AltaVista that records each URL (universal resource locator) it finds on a page. The Foresight Institute offers a program called CritMap (http://www.crit.org) that also serves this function.

bolt-on—A bolt-on is a Web application, often facilitating things such as e-commerce, that Web developers can quickly add to their existing Web sites. Typical bolt-on applications include things such as shopping cart features, product searches, and credit card processing applications. A bolt-on application typically includes templates that make it easy to customize the feature, by adding logos and other proprietary features, to fit the rest of your site.

bookmark portal—Falling into the growing category of ASPs (Application Service Providers), bookmark portals let users track their favorite Web pages online. Using a bookmark portal lets you manage one set of bookmarks (Bookmarks or Favorites, depending on your browser of choice) for all the computers and browsers you use without the need to duplicate each change you make at work, at home, or on a notebook PC.

bounce e-mail—An e-mail that returns to the sender because the recipient's address is incorrect or belongs to a recipient the server no longer recognizes. A bounce e-mail usually appears in the form of a message from a system administrator or mail server in the original sender's inbox with the e-mail in question attached.

C2C (consumer to consumer)—Describes networks such as Gnutella and Freenet where consumers (client applications) do business with other consumers without involvement from business servers.

CFML (Cold Fusion Markup Language)—A tag-based scripting language used in an application developed by Allaire, called ColdFusion, that lets Web designers make Web pages that interact with databases. CFML tags are similar in nature to standard HTML (Hypertext Markup Language) tags, but they work with ColdFusion to replace lengthy CGI (common gateway interface) and Perl scripts that perform similar functions outside the ColdFusion application.

cHTML (Compact Hypertext Markup Language)—A subset of standard HTML (Hypertext Markup Language, the primary commands that tell Web browsers how to display Web pages) used to construct Web pages compatible with the i-mode wireless Web phone standard in Japan. Its similarity to HTML makes it easier to build Web pages for i-mode phones than for than the competing European and North American WAP (Wireless Application Protocol) standard because HTML programmers already know the commands.

COPS (Common Open Policy Service) Protocol—The IETF (Internet Engineering Task Force) is considering COPS as a possible standard protocol for exchanging network policy information between various points on a network in order to prioritize transmission requests. COPS distinguishes between types of transmissions (voice, data, etc.) and their bandwidth requirements and helps organize the flow of subsequent traffic based on a network's prioritization policies to increase network efficiency.

cornea gumbo—A visually busy Web page or ad that incorporates so many colors, graphics, fonts, and other visual devices that it becomes confusing or unattractive.

Cuckoo's egg—A downloadable file on the Internet that is falsely named. People create these files as practical jokes, and they are commonly found at Web sites that offer free music downloads. For example, you might think you are downloading a MP3 of "American Pie" by Madonna, when the file is actually "Easter Parade" by Perry Como or just full of other noises or no noise.

cybercide—An expression for killing another person's online character or persona in a multiplayer game or an Internet chat room.

drownloading—Downloading multiple files from the Internet simultaneously and accidentally crashing your computer. You can drownload your system if you download multiple audio files or large image files, and the computer can't keep up. Your system might stop downloading, freeze, or crash. You can prevent drownloading by downloading only one or two files at a time.

emailingering—A tongue-in-cheek reference to doing little at work and doing a great deal of Web surfing and sending e-mail to seem busy, even to the point where the emailingerer feels he has been hard at work. Emailingerers spend considerable amounts of time creating unnecessarily elaborate presentations, documents, or spreadsheets that will only be used internally or sending e-mail back and forth to others just to make simple decisions.

fasgrolia—The fast-growing language of initialisms and acronyms. Fasgrolia refers to the amazing proliferation of computer and Internet-related terms such as HPC (Handheld PC), HTTP (Hypertext Transfer Protocol), DNS (domain name server), and many others. Explaining and helping our readers understand the fasgrolia without a full-time interpreter is one of *Smart Computing*'s core missions.

filler app—An Internet application that is not quite a killer app (one that revolutionizes a particular process and is better than its competition), but it is decent and is likely to be "acquired" by a larger company soon after its launch.

glocalization—Refers to global localization, which is giving a Web site or digital property a local look and feel for each language and culture around the globe. Yahoo! and MSN (Microsoft Network) are both good examples of glocalization because both have sites in different languages that are specifically targeted at the people of several countries. Glocalization will become increasingly important for businesses as the Internet brings the international community closer together.

Hyper-G—A Web publishing system similar to but more advanced than traditional hypertext languages. The Institute for Information Processing and Computer Supported New Media (IICM) of Austria developed Hyper-G with the help of a number of outside researchers and the ideas of Ted Nelson (Nelson coined the term hypertext in 1965). Hyper-G is available in a commercial version called HyperWave, which allows bidirectional hyperlinks (including backlinks), author control over who can view or update the document, and other advanced features.

i-mode—An emerging wireless Web phone standard created by telecommunications company DoCoMo in Japan. The standard includes phones with larger, business-sized LCDs (liquid-crystal displays) that feature higher resolution than Web phones in the United States and Europe (some even display 256 colors). Because they have higher-resolution screens, i-mode phones offer crisper text and can even display simple graphics. The language used to program i-mode Web pages (cHTML, Compact Hypertext Markup Language) is essentially a scaled-down version of HTML, so these pages are easy to build.

Internesia—A fun name for when you find an item (or, in fact, an entire Web site) that you like, need, or want to show to someone but then forget where on the Internet you saw it. Sometimes you can treat Internesia by perusing your Web browser's history file, and you can prevent it altogether by bookmarking such sites.

laganoia—The fear of being ignored or ostracized in the online community brought about by delays in Internet chat rooms, message boards, and Internet telephony communications due to a network lag. People communicating by such means may experience laganoia if responses to their messages are a long time coming. Sometimes, though, other users are responding, but responses take a long time because of poor bandwidth or problems with transmittal from one portion of the Internet to another.

moved to Atlanta—A sarcastic reference to Web pages that disappear, leaving only 404 File Not Found errors in their place. Because 404 is an Atlanta area code, witty Web surfers say missing pages have moved to Atlanta.

new economy—In some cases, this phrase is equated directly to the revenue, jobs, and lifestyle changes brought on by the emergence of the Internet as a mass media and a commercial revolution. The Internet certainly plays a large part in the new economy, but there is much more to the story. In a broader sense, the new economy relates to fundamental changes in the world economy as a whole as it moves away from a segmented, production-oriented model to one that favors knowledge and the ability to find global solutions. For example, two companies that make the same product may produce items that are almost identical in nature. But in the new economy, the one that finds better ways to get its product to the right people and make lasting relationships with its customers will probably be more successful. Because technology is the chief aid to achieving these things, computers and the Internet are seen as driving forces behind the world's economic transformation.

post-economic—When you earn enough money that you can retire at any age and never again consider the economic realities that most people live with each day. Although there have always been millionaires and billionaires, this term has special significance in the new economy. The emergence of computers and the Internet as major economic forces has made a great many people independently wealthy in the past 20 years or so.

spampoena—A subpoena distributed to hundreds of recipients through e-mail. Prosecutors distributed the first spampoena in the case of CPhack, a program developed with the intent of countering parental Internet control software called Cyber Patrol. Cyber Patrol required a parental password to view sites with pornographic or otherwise objectionable Web content, and CPhack was programmed to give users the password, thereby circumventing Cyber Patrol's protection. During a legal battle in Massachusetts in March 2000, a U.S. District Judge allowed the prosecution a restraining order against the program's makers and approved the prosecution's request to distribute subpoenas to sites distributing CPhack via e-mail. The ACLU (American Civil Liberties Union) later protested such distribution of subpoenas on the ground that it violated the rights of third parties receiving the subpoenas, as well as the spirit of laws governing the serving of subpoenas.

Web bug—A term used to describe a graphic item placed on a Web page to monitor individual readers. Advertising agencies often place bugs on various Web pages to gather information about the Web page visitor's computer, the pages the user has visited, the time the bug's page was viewed, and other information. This data is then used to determine the type of banner ads shown to the viewer. Typically, these small (only 1 pixel x 1 pixel in size) "invisible GIFs" or "clear GIFs," as they are sometimes called, often go unnoticed by a reader.

WML (Wireless Markup Language)—Formerly called HDML (Handheld Devices Markup Language), this is an open programming language for creating Web pages that are viewable with Web-enabled phones and PDAs (personal digital assistants). Several major U.S. wireless phone networks such as AT&T Digital PocketNet and Sprint PCS Wireless Web use WML-compatible phones and software. RS

The High-Tech Health Report

Computer Industry Highs & Lows

America has always had a love affair with technology. Now, in a time when technological innovation seems to come at a faster and faster pace, we have become almost as fascinated with the *business* of technology. Every year hundreds of thousands of companies set up shop, each promising to provide the next big thing. It's an offer too tempting to resist for venture capital firms all too eager to get in on the ground floor of what might be the next Microsoft.

Tempering this excitement, however, is the realization that technology markets are becoming increasingly competitive. In order to try to gain an edge in a market, manufacturers have to price their products aggressively. The result is price pressure within a market segment. If Seagate, for instance, lowers prices on its hard drives, other hard drive manufacturers are forced to do the same. As a result, some industries are shipping record numbers of units but losing money.

Prices are sinking and demand is growing in almost every technology segment. Some segments, such as palm-sized computers and personal digital recorders, are growing rapidly. These markets are yet to see the kind of price cuts that are affecting other segments of the hardware industry. Older segments continue to grow although at a slower pace.

■ **Systems.** Don't believe the rumors that the PC is dead; PC sales remain very strong. According to IDC (International Data Corporation), worldwide shipments of PCs increased by 14.5% in the second quarter of 2000 over the same quarter a year ago.

Many of the sales are coming from overseas. Japan, for instance, saw a 35% growth in PC sales during the second quarter of this year. Other markets in Asia also added significantly to the growth, while the U.S. market only grew by a modest 7.2%.

According to IDC, Dell has moved past Compaq as the No. 1 retailer of desktop PCs in the United States with 19.6% of the market to Compaq's 14.5% in the second quarter of this year. This is rather remarkable considering Dell restricts itself to direct sales while Compaq is widely distributed at various electronic retailers, such as Best Buy and Circuit City. Compaq, however, shipped more units worldwide than Dell although Dell's worldwide sales are growing rapidly. Hewlett-Packard ranked No. 3 and IBM No. 4 in total U.S. shipments for the quarter.

But despite the continued strength of PC sales, many companies are giving attention to a new generation of devices known as information appliances. IDC predicts that by 2004 the total worldwide revenue from Internet appliances will be about $17.8 billion compared to $274 million for PC sales. These numbers alone are a little misleading since IDC includes a wide variety of devices, such as gaming consoles with Internet capabilities, wireless access devices (including mobile phones and PDAs [personal digital assistants]), Web terminals such as WebTV, as well as simple e-mail terminals in the Internet appliance category.

Compaq has begun to move into the Internet appliance market with its line of iPAQ devices. Compaq's iPAQ Home Internet Appliance IA-1 is designed to offer cheap and simple Internet access. The unit ships with a keyboard, a 10.1-inch flat-panel display, and four USB ports. The cost is nearly $600, but a $400 MSN instant rebate knocks the price down to about $200. You do have to sign a three-year contract to receive the service, but the Internet Appliance is designed to connect via MSN anyway.

Another company, Netpliance, introduced its i-opener this year and was originally offering the device for an introductory price of just $100. The introductory price ended in July, and the device now costs $300. Like the iPAQ Internet appliance, the i-opener features a 10.1-inch LCD panel and USB ports. Netpliance provides the Internet service for $21.95 a month.

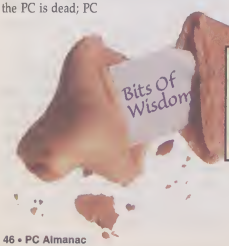
Business systems. There's no danger of the business market switching over to Internet appliances. Shipments of both servers and workstations were good in the second quarter of 2000 although they did fall short of expectations, according to Gartner's Dataquest.

Server shipments grew only 11% overall in 1999 with Compaq, Dell, IBM, Hewlett-Packard, and Sun Microsystems leading the charge. Compaq shipped the majority of servers, but Sun Microsystems showed a growth rate of more than 70% in the second quarter and Dell posted a growth rate for the second quarter of more than 36%. IBM showed negative growth at -16.9%.

Dell did the most to help the second quarter growth rate of 14% in the workstation market with 100,000 shipments, which equals a 22.7% market share for Dell. Hewlett-Packard was in second place for the quarter with 90,275 shipments and 20.5% market share while Sun

Just the Facts!

In 1999, just less than 4 million PDAs (personal digital assistants) valued at more than $1.5 billion were shipped worldwide. Analysts estimate that in 2000 these numbers will jump by 50%, to shipments of more than 5.9 million units valued at $2.3 billion. (Source: IDC.com)



"The NASDAQ crash reminded venture capitalists everywhere that natural selection does indeed apply to dot coms."

Microsystems came in third with 85,000 units and 19.3% market share.

Processors & Semiconductors. Intel has long held the dominant position in the CPU industry, but AMD is starting to put some serious heat on the microprocessor giant. AMD helped to create a market for the sub-thousand dollar PC with its low priced K6 line of processors. In order to keep from getting locked out of the low-end market, Intel had to respond with its Celeron line of low-end processors.

This year marks the first time that AMD was able to compete with Intel in the high-end desktop processor market. AMD's new Athlon processor is a serious competitor to the Intel Pentium III. For several months the companies have been vying for the title of fastest processor, with the honors alternating between the two. The race helped to push both companies past the 1GHz (gigahertz) mark.

In January of 2000, PC Data found that AMD processors powered 37% of all units sold, AMD's best showing in nine months. January also marked the first month that the average retail price of an AMD system was higher than an Intel system, demonstrating both the relative success of AMD's high-end Athlon processor and the popularity of Intel's low-end Celeron processor. According to PC Data, 62% of all systems under $1,000 were branded with the "Intel Inside" logo.

Financially, Intel is still far ahead of AMD. In 1999, Intel managed to post a net income of more than $7 billion while AMD posted nearly an $89 million loss. Intel also managed to post impressive total revenues of $29 billion in 1999, while AMD's total revenues approached the $3 billion mark. In the second quarter of 2000, AMD did manage to make a $207 million profit.

Semiconductors. The Semiconductor industry provides the basics needed to create a wide variety of computer chips, including those used in memory modules and processors. The semiconductor market has had a tough go recently but is beginning to show signs of rebounding.

According to Gartner's Dataquest, the semiconductor market grew 22% in 1999 and Dataquest expects that rate of growth to increase to 31%, or $222 billion, in 2000. By 2004, Dataquest projects the semiconductor market to be about $320 billion. They attribute much of the short-term growth to an increased demand for chips used in DRAM (dynamic random-access memory).

Hard Drives. Nearly all of the biggest hard drive manufacturers have reported decreased revenues and decreased net income. These decreases come despite the fact that most manufacturers have reported record shipments and a high demand for hard drives. The increased sales, however, can't compensate for the continually falling prices. This leads to lower gross profits and leaves little money left over for typical operating expenses.

Western Digital derives all of its revenue from hard drive sales and, unlike most of the major hard drive companies, reported a decrease in unit shipments as well as a decrease in the average unit price. This led to a drastic 22% decrease in total revenues in 1999. Western Digital's cost of sales, in fact, was more than its total revenues, leading to a gross loss of $2 million and a net loss of $15 million.

Seagate, whose fiscal year 2000 ended in June, managed total revenues of $6.4 billion and a net income of $310 million.,Even though these numbers were relatively good, they were less than the year before when Seagate posted $6.8 billion in revenues and a net income of more than $1 billion.

In March 2000, Seagate made an interesting move: It announced that it was being bought by a private group of investors and will revert from a publicly traded company to a privately held one.

Networking. Although sometimes it doesn't seem as though it's coming fast enough, broadband will mean a host of new opportunities for manufacturers when it arrives in more homes. As more and more consumers make the switch to broadband, networking equipment manufacturers will begin to crank out the new hardware needed to support such Internet connections. Cable and DSL (Digital Subscriber Line) modems have already begun to find their way to consumers. Broadband will also give rise to an increased demand for home networking equipment that allows users to share their fast connections with other computers in their homes.

According to Cahners In-Stat Group, sales of both cable and DSL modems are increasing, but DSL equipment seems to be gaining the

Just the Facts!

In 1997, 3Com buys $6.6 billion in U.S. Robotics stock, making the consolidation the largest in the history of computer companies.

Dates To Remember

In April of 1994, David Filo and Jerry Yang, graduate students in electrical engineering at Stanford University, created Yahoo! to keep track of their favorite Internet Web sites.

Do You Know...

how much money venture capital companies invested in technology companies in 1999?

VC firms pumped $32.4 billion (or 90% of all venture capital investments) into IT and dot-com companies last year, with $19.9 billion (or 56% of venture investments overall) going to Internet companies alone. According to Price Waterhouse Coopers, bullish investments in tech firms contributed to a 150% overall increase in venture capital funding last year.

upper hand. Cahners claims that DSL equipment sales are about 50% higher in each quarter of 2000 so far then they were in the same quarter from a year ago. Meanwhile, cable modem growth was only 31% in the first quarter of 2000 and 24% in the second quarter.

In the DSL market, Efficient and Alcatel are the leading manufacturers of DSL equipment for consumer use. Both companies together managed 56.7% market share with the majority going to Efficient. Motorola is the leading producer of cable modems with a 32.3% share, according to In-Stat.

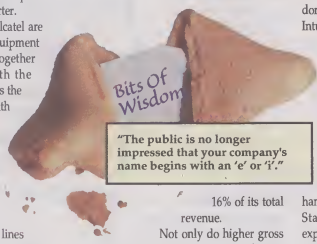
Home networking equipment is also expected to be a major market in the coming years although it's still in its infancy now. Companies such as Intel and 3Com each offer networking kits that take advantage of the telephone lines in your home to network two or more computer systems. Other companies, such as Proxim and Apple, have wireless home networking products that use radio waves to connect one computer to another. The advantage of home networking grows as more households make the switch to broadband technologies because it allows all the computers in a household to share one high-speed connection.

According to Cahners In-Stat Group, the home networking market grew to $48 million in the fourth quarter of 1999 and continued to grow to $58 million in the first quarter of 2000. Sales of phone line networking products slowed somewhat due to an overstocked channel, but sales of wireless networking equipment continued to increase.

The home networking market is a brand new one, and Cahners cautions that it will take some time for vendors to find an effective way to get their products to the public.

Software. In some ways, software is just another component of a PC. Without software, a computer is as useless as it would be without a processor or RAM. The software industry, however, benefits from the fact that it can operate like a publisher instead of a manufacturer.

A publisher doesn't have to contend with high materials costs to produce its products, as manufacturers do. This means a lower cost of sales and higher gross profits for software companies. Cost of sales for IBM and Hewlett-Packard, for instance, averaged about 65% of each company's total revenues, leaving only 35% of revenue to pay for operations and other expenses. In contrast, software company Symantec's cost of sales amounted to just 16% of its total revenue.



Not only do higher gross profits help keep the software industry strong but the industry also continues to show increasing revenues in some software categories. According to PC Data, overall software revenue in 1999 rose 8.7% in the United States to $5.6 billion. Financial software showed gains of 23.2%, while business software showed gains of 10.4%. Computer games also increased more than the overall software market, showing a 1999 increase of 9.2%.

Not all software categories had such a great year, however. Personal productivity software saw only a 2% gain, while educational software managed meager gains of 1.2%. Sales of reference software, on the other hand, fell 12.2% in 1999. The average price of computer software also fell in 1999 to a little less than $38, a decrease of about 1.8%.

It should come as no surprise that Microsoft's 23.6% of total software revenues was the largest share of any software company. The next closest company, Mattel, only had 12% of total software revenues in 1999. In business software, Microsoft saw an even greater piece of the pie with 41% of the market. Symantec finished second in business software, far behind Microsoft with 11.6%.

One of the few categories Microsoft didn't dominate was the financial software category. Intuit, the maker of Quicken and other popular financial software, contributed nearly 81% of the total revenues for financial software.

Other Markets. Analysts are expecting a number of new markets to take off over the next few years.

One new market expected to see significant growth is the PDA market. According to IDC, more than 2 million handheld PCs shipped in 1999 in the United States, and another 3.6 million units are expected to ship this year.

By 2004, IDC projects U.S. shipments will exceed 9.5 million units and approach $3 billion in revenues. Total worldwide revenues from handheld devices are expected to be more than $5.5 billion on more than 17 million units shipped. The average price of handheld computers should also come down somewhat over the next few years. According to IDC, the average handheld computer in the United States cost nearly $400 in 1999. By 2004, that number should be down to about $300. Low-end PDAs are making an entrance into the market, as well. In August Palm introduced its new Palm m100, a $150 palm-sized computer.

Another consumer device that's expected to take off in the next few years is the PVR (personal video recorder). Major players in this market include TiVo and ReplayTV. These digital set-top boxes automatically record video and audio to a large hard drive for future playback. TiVo and ReplayTV provide the software and services to enable recording and management of video on the hard drive. Hardware manufacturers including Phillips, Sony, and Panasonic manufacture and sell the actual devices. Cahners In-Stat Group predicts unit shipments of PVRs will increase 275% per year between 2001 and 2003. By the end of 2003, more than 8 million PVRs are expected to be in use.

Although the real growth in the PVR market is a few years off, digital cameras are already becoming a hot item. IDC expects digital cameras to generate about $4.3 billion in

"They Said It..."

The venture capitalists have been spending money like drunken sailors.

Sandy Robertson, technology financier, The Industry Standard, April 4, 2000

They Said It...

"There are a lot of cooks onstage here. But there's a big meal to be served."

-Steve Case, chairman and CEO of AOL, on the ability of the many high-powered executives from AOL and Time Warner working together following the merger of the companies, The Industry Standard, Jan. 10, 2000.

worldwide revenue in 2000. In 1999, the digital camera market grew more than 200% in the United States and 125% worldwide. According to IDC, this kind of growth will generate increased revenues even though prices will continue to fall.

HDTV (high-definition television) occupies the same place in some of our minds as does the sunken city of Atlantis. That is to say, we've heard of HDTV, but most of us think it's some sort of myth. According to Cahners In-Stat Group, however, that should change over the next few years as prices begin to fall. Cahners estimates 500,000 units will ship by the end of this year, and by 2004, 5.9 million digital television units will be shipping as more digital broadcasts and lower unit prices help increase sales. However, the majority of digital television sales will not be from HDTV but from lower resolution SDTV (standard definition television).

Also confined, at least so far, to the realm of mythology is a technology known as Bluetooth. Bluetooth allows for wireless ad-hoc networking between multiple Bluetooth devices over short distances. For instance, if you have a Bluetooth enabled PDA and computer, your PDA may synchronize with your desktop when you walk into the room. Or your Bluetooth enabled camera may communicate with your Bluetooth enabled cell phone to transmit digital images to your home PC.

According to Cahners, Bluetooth devices should begin to make an appearance toward the end of this year. If that sounds familiar, it might be because analysts have been saying the same thing about Bluetooth for some time and yet no Bluetooth enabled devices seem to have made it to market. Cahners, however, expects manufacturers to turn out more than 1 billion Bluetooth units by 2005.

■ **E-commerce.** At the end of 1999, e-commerce stocks were soaring high as investors hoped to get in early on the next big technology company. Many e-commerce companies, however, have yet to show a profit, and the lack of profits is finally beginning to be of concern to investors.

Just the Facts!

There were 436 computer technology companies (Internet software, services, computer software and computer hardware) that had IPOs (initial public offerings) of stock last year. (Source: IPO.com)

As a result, e-commerce companies have had a rocky ride in 2000. (*NOTE: For a more complete overview of the e-commerce sector, see "The Dot-Com Roller Coaster Ride."*)

■ **Capital Ideas.** Most entrepreneurs don't have millions of dollars of their own in the bank. The money needed to start a business often comes from outside investors, and it's the entrepreneur's job to put together a business plan and sell it to potential investors. Investments can come from individual "angel" investors or venture capital companies. Initial investors typically look for 15% to 20% returns on their investments.

When a startup begins to run low on cash, it can exercise several different options. Often, young companies will begin looking for more money from investors in a second or even third round of financing. A more mature company has two other options: sell out to a larger company or take the company public with an IPO (initial public offering).

Venture capital companies love high-tech startups. According to PricewaterhouseCoopers' 1999 Money Tree report, venture capital companies invested $11.5 billion in startups in 1997 with $8.1 billion going to technology startups. By 1999 venture capital firms had invested $35.6 billion in startups, with $32.4 billion going to technology firms.

Silicon Valley is considered the Mecca of high-tech startups, and a glance at the venture capital figures helps to show why. Silicon Valley captured more investment dollars than any other location, landing more than $13 billion in investments in 1999, according to PricewaterhouseCoopers. New England was a distant second, with a little more than $4 billion in venture capital investments.

Venture capital investments have climbed dramatically over the last three years and continue to climb. According to the PriceWaterhouseCoopers' second quarter Money Tree report for 2000, venture capital investments climbed from slightly over $14.6 billion in the fourth quarter of 2000 to just over $19.5 billion in the second quarter. Of the $19,5 billion invested in new companies during the second quarter, 95% went to technology-related companies. Investments in Internet companies, however, have fallen off in the first half of 2000. Almost 65% of all investments in technology related companies went to Internet companies during the fourth quarter of 1999. In the second quarter of 2000, that number fell a bit to about 63%.

So long as large sources of capital exist, new startups will continue to come into the scene. Some new companies, such as palm-sized computer manufacturer Handspring, enter existing markets looking to make a name. Other companies, such as TiVo, see a new possibility and try to bring new products to market. A large portion of new companies will eventually fail, so would be entrepreneurs must continue to overcome the caution of venture capital investors with the lure of future profits. RS

by Chad Denton

GUESS WHO?

This former MIT engineer and Digital Equipment founder, considered by many to be one of America's most successful entrepreneurs, once said, "There is no reason anyone would want a computer in their home."

Answer: Ken Olson

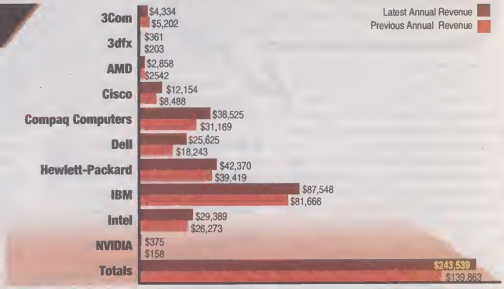
The Hot & The Not: Industry Trends

Technology is one of the market's hottest sectors. We've chosen a sampling of well-known ISPs, hardware, software, and telecommunications companies and compiled statistics to provide you with a general overview of the year in high tech.

Hardware

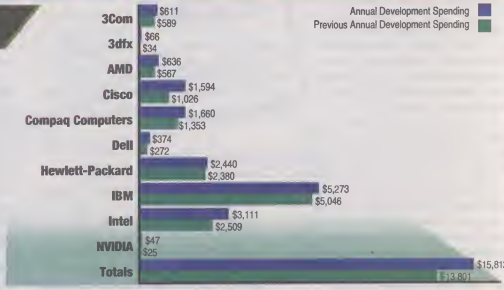
Revenue For Popular Hardware Companies

As an indication of overall activity in the market, we offer a glimpse of the 1999 year-end revenues for a few of the better known hardware companies. We've included microprocessor manufacturers, video card manufacturers, system manufacturers, and big name manufacturers that produce a variety of products. Figures are from the companies' most recent annual reports. All numbers are in millions of dollars.



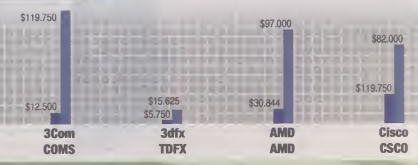
Hardware Manufacturers' Development Expenses

The largest expenditures come from major hardware manufacturers that have to develop products in a variety of different sectors to stay competitive. Figures are from the companies' most recent annual reports. All numbers are in millions of dollars.



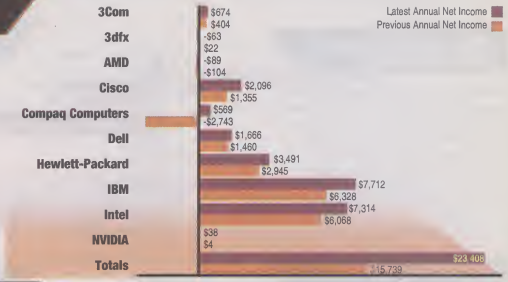
Hardware Manufacturers' 52-Week Stock Price Ranges

Looking over the highs and lows of stock prices is a good way to get an idea of how the market feels about a company's stock. The hardware giants, such as IBM and Hewlett-Packard, have seen some extremely high stock prices in the last year. 3Com achieved a stock price high of over $100 in the last year, but it also managed to turn a low of less than $19 per share. All figures were current as of Aug. 18, 2000.



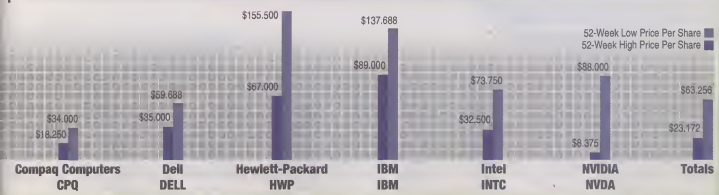
Hardware Manufacturers' Net Incomes

In the end, hardware can still be a lucrative business. The average net income among all companies listed here was more than $1 billion. Two of the companies listed failed to make a profit in 1999. Figures are from the companies' most recent annual reports. All numbers are in millions of dollars.



Hardware Manufacturers' Quarterly Financial Numbers

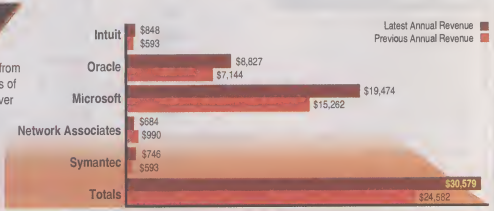
Some of the most popular hardware manufacturers are continuing to have a good year in 2000. Figures are from the companies' second quarter reports. All numbers are in millions of dollars.



Software

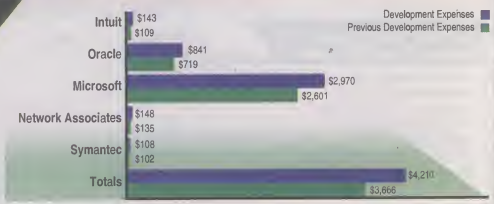
Software Manufacturers' Annual Revenues

Although not as high as revenue generated from some hardware companies, the heavy hitters of the software industry have not done badly over the last two years, especially considering most of these companies don't sell the same variety of products that hardware manufacturers do. Figures are from the companies' most recent annual reports. All numbers are in millions of dollars.



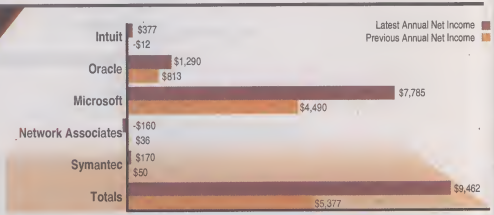
Software Manufacturers' Development Expenses

Just like hardware companies, software companies can't afford to stay idle. Many companies are pouring significant amounts of money into research and development hoping to stay ahead of their competition. Figures are from the companies' most recent annual reports. All numbers are in millions of dollars.



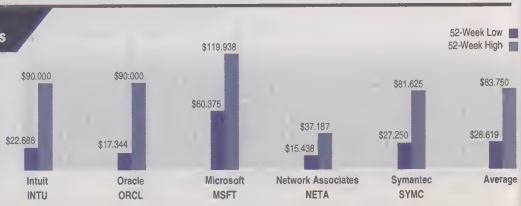
Software Manufacturers' Net Incomes

Yet again, Microsoft is out in front of the pack when it comes to net revenue, raking in more than $6 billion more than archrival Oracle. Figures are from the companies' most recent annual reports. All numbers are in millions of dollars



Software Manufacturers' 52-Week Stock Price Ranges

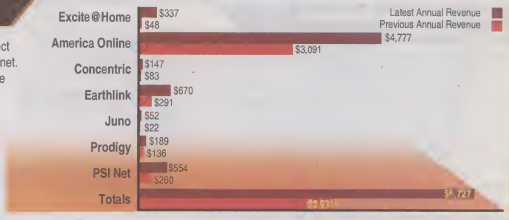
Microsoft has seen its stock soar the highest in the last year while Network Associates suffered the lowest stock prices of the companies profiled below. Figures were current as of market close on Aug. 18, 2000.



Internet Service Providers

ISPs' Annual Revenues

ISPs (Internet service providers) connect consumers and businesses to the Internet. A few new ISPs, such as Excite@Home provide exclusive broadband content while other ISPs in our list, such as Juno, provide free Internet access. Figures are from the companies' most recent annual reports. All numbers are in millions of dollars.

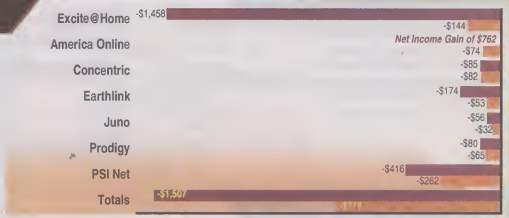


ISPs' Annual Development Expenses

In order to keep customers happy, ISPs have to invest in upgrading their infrastructures to handle new customers and implement new technologies. Figures are from the companies' most recent annual reports. All numbers are in millions of dollars.

ISPs' Annual Net Incomes

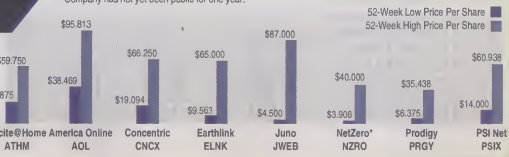
The bottom line wasn't that great for many ISPs last year. Figures are from the companies' most recent annual reports. All numbers are in millions of dollars.



ISPs' 52-Week Stock Price Ranges

Over the last year, ISPs have gone through some highs and lows. NetZero, an ISP that provides free Internet access, fell to below $4 a share while AOL topped out at about $95 a share. Information was current as of Aug. 18, 2000.

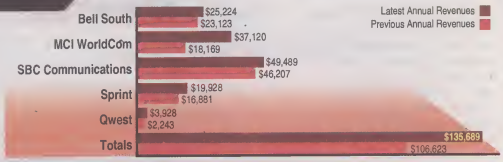
* Company has not yet been public for one year.



Telecommunications

Telecommunication Companies' Annual Revenues

Since the telecommunication industries run the networks on which the Internet depends, they stand to gain considerably as the Internet moves into the mainstream. To the right is a list of five well-known telecommunications companies and the total amount of money they've made over the last two years. Figures are from the companies' most recent annual reports. All numbers are in millions of dollars.

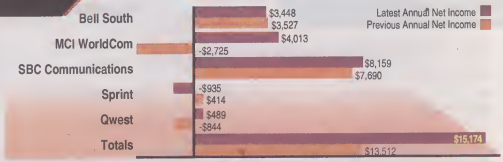


Telecommunication Companies' Annual Operating Expenses

Telecom companies must maintain their network and actively be looking to expand by offering new services. Figures are from the companies' most recent annual reports. All numbers are in millions of dollars.

Telecommunication Companies' Net Income

Despite the high operating expenses associated with the telecom industry, high annual revenues help to generate strong net incomes. Figures are from the companies' most recent annual reports. All numbers are in millions of dollars.



Telecommunication Companies' 52-Week Stock Price Ranges

Despite some impressive end of year profits, telecommunication companies don't seem to be as highly valued as some of the larger hardware companies such as IBM or Hewlett-Packard, but the lowest stock values are around $30 a share. The figures were current as of Aug. 18, 2000.

Venture Capital

Venture Capital By Geographic Location & Sector

Why is Silicon Valley such a hot place for startups? Obviously there's a lot of money in the Valley. Silicon Valley-based firms managed to secure more cash than similar firms based elsewhere in the country. All numbers are in millions of dollars.

	Number of deals	Amount Invested	Percent of total VC invested in segment
Silicon Valley			
Business Services	150	$1,599	35.0%
News Media	97	$1,269	43.8%
Software	328	$3,033	46.0%
Retailing/Distribution	82	$1,156	32.2%
LA/Orange County			
Business Services	39	$468	10.3%
News Media	28	$272	9.4%
Retailing/Distribution	29	$573	16.0%
Northwest			
Retailing/Distribution	23	$398	11.1%
New England			
Business Services	63	$525	11.5%
News Media	24	$321	11.1%
Software	135	$1,028	15.6%
Retailing/Distribution	32	$259	7.2%

	Number of deals	Amount Invested	Percent of total VC invested in segment
D.C./Metroplex			
Software	47	$312	4.7%
Midwest			
Business Services	50	$425	9.3%
Retailing/Distribution	24	$264	7.4%
New York Metro			
Business Services	31	$367	8.0%
News Media	39	$263	9.1%
Southeast			
News Media	17	$226	7.8%
Software	58	$434	6.6%
Texas			
Software	59	$302	4.6%

Source: PricewaterhouseCoopers Money Tree Survey

Venture Capital Dollars Invested & Average Deal Size

VC (venture capital) is an important source of revenue for startups. Technology-related startups played a major role in VC investments in 1999, capturing the vast majority of investments. Numbers are in millions of dollars.

Overall VC Investments

1997	1998	1999
$11,483	$14,233	$35,591

Amount Invested In Technology

1997	1998	1999
$8,057	$10,771	$32,354

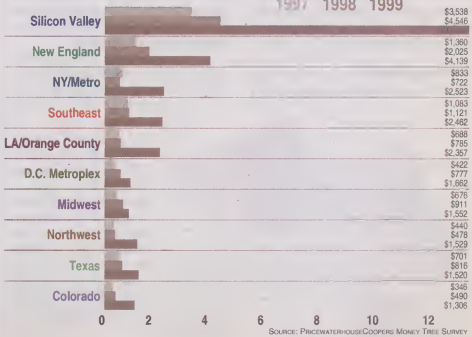
Amount Of Average Deal

1997	1998	1999
$17.21	$20.54	$36.54

Source: PricewaterhouseCoopers 1999 Money Tree Survey

Venture Capital Investments Over Time By Location

For the last three years, Silicon Valley has continued to garner the majority of VC dollars. Below is an overview of technology related VC investments by location for 1997 to 1999. Numbers are in millions of dollars.



Source: PricewaterhouseCoopers Money Tree Survey

The Dot-Com Roller Coaster Ride

Internet Companies Sizzle & Fizzle

Much as the Industrial Revolution changed life at the beginning of the 20th century, the Internet is changing life in the 21st century. The transition that occurred in the early 1900s was a shift from agriculture to manufacturing, and it had a dramatic effect on the economy and culture. At the time, the economic boom brought about by the industrial revolution was bigger than anything we had seen before.

Today, the Internet revolution is creating a unique period of economic growth and expansion. It's easy to get caught up in the hype and forget that markets grow only to a point. Even this period of economic expansion will have to come to an end as markets mature and the phenomenal growth of many technology companies, particularly Internet companies, begins to slow.

Already we're seeing signs of a downturn in Internet stocks that may mark the beginning of the end for many Internet companies. Although last Christmas season saw tremendous growth in the popularity of online shopping, in January 2000, many dot-coms stumbled. And Wall Street reacted accordingly: Investors who once overlooked continually growing annual losses began to look more closely at the bottom line.

■ **Online Retailers.** Just three years ago there were few companies interested in selling anything online. Most saw the Internet as a tool for disseminating information to perspective customers and only the most ambitious sought to sell products over the Internet. In 1997, creating a Web site that would allow customers to order a product online was an expensive and complicated proposition that often required the seller to set up all the hardware and software itself. Amazon and Dell were two of the pioneers in what is today referred to as B2C, or business-to-consumer sales.

The B2C segment was one of the first e-commerce segments to receive a lot of attention. As more companies began to accept orders online, it became easier and more attractive for other companies to do the same. As it became easier to implement an e-commerce system, B2C companies began to explore different markets and to differentiate themselves from the competition.

As e-commerce grew, new companies began to focus on entirely different markets, giving birth to B2B (business-to-business) and P2P (peer-to-peer) e-commerce segments.

Part of the reason B2C companies became so popular in 1999 was because they were growing faster than any business segment had before. As new online shoppers logged in, revenue grew rapidly and that caught the attention of Wall Street. Amazon is a perfect example of this growth. The company saw revenues rise more than $1 billion in 1999.

Looking at the numbers, the potential for rapid expansion remains in the B2C segment. Forrester Research's Post-Web Retail report predicts close to $40 billion in revenue from online sales in the United States in 2000. Forrester expects that number to climb to $184 billion by 2004. IDC (International Data Corporation) expects worldwide online sales revenue to be in the neighborhood of $1.6 trillion by 2003.

Currently, the annual increase in online revenue comes primarily from new shoppers, but the number of new online shoppers is expected to peak this year at 11 million new households. By 2004, new online shoppers will amount to only 2.6 million households, according to Forrester. That means after 2000, new online shoppers will comprise less and less of a percentage of e-commerce revenues. However, as indicated by Forrester, e-commerce can expect increased revenues as households increase the amount of money they spend online, as more everyday purchases begin to move to the Web. According to Forrester, the average household that shops online will spend more than $3,500 a year online, up from just under $1,500 in 2000. Furthermore, Forrester expects a second explosion in e-commerce in 2010 as Generation Y reaches its maximum earning potential.

■ **B2C.** As the first e-commerce sector to garner major attention from Wall Street, many B2C companies enjoyed inflated stock prices in 1999. Companies that had never shown a profit often traded for more than $100 per share. In 2000, however, things changed. Even former B2C darlings, Yahoo! and Amazon.com, suffered severely reduced stock prices. Many investors have begun to look toward other e-commerce segments for investment opportunities.

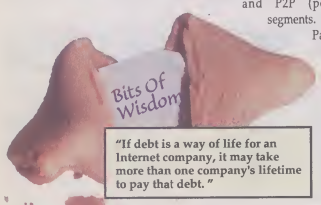
Amazon.com, despite being one of the best-known B2C companies, has never shown a profit. Over the last several years, the company's bottom line has continued to slip further

GUESS WHO?

With Robert Noyce, he co-founded Intel in 1968 and declared that computing power for the industry would double every year and a half, a rule that still holds true today.

?

Answer: Gordon Moore



Dates To Remember

On April 1, 1976, Steve Jobs and Steve Wozniak marketed the Apple I and started a company called Apple Computer Corporation.

and further into the red, yet the company enjoyed a 52-week high in December 1999 of $113 per share. In the summer of 2000, Amazon stock hit a 52-week low of about $28 per share after the company once again posted a net loss despite increased revenue.

B2C companies have a difficult time making profits primarily because they exist in such a hostile environment. In order to survive the competition, a company must develop brand recognition through marketing and must continue to develop its site and services. This is why, of the $719 million Amazon lost in 1999, $413 million were spent on marketing and $159 million on development.

The fierce competition in this sector has forced many companies to shift their focuses or shut down entirely. Beyond.com, a company that originally sold software to consumers over the Internet, backed away from the B2C segment in January. The company announced it would cut back 75 jobs, or roughly 20% of its workforce, and begin to move away from the B2C segment and into the B2B segment. Currently, Beyond.com runs a number of software stores for companies such as Symantec and McAfee.

When CDNow announced an unpopular merger with Columbia House, its stock price began a rapid slide, which forced the company to abandon its merger plans. CDNow sells music and movies to consumers, which puts it in direct competition with Amazon. The competition is taking its toll on CDNow: The company lost nearly $119 million in 1999 and its stock price fell to nearly $2 a share.

Other companies have had fatal problems. Boo.com, for instance, launched as a tragically hip online clothing retailer but burned through its capital at an incredible pace. Although Boo.com sought additional investors, it could find no one willing to put up the money it needed to stay operational. Another more recent shutdown was Value America, an online B2C retailer. The company announced in August that it would shut down its online retailing operations and restructure under Chapter 11 bankruptcy. As part of the restructuring, Value America had to let go 185 employees.

eToys and Pets.com have both struggled over the last year or so, and the once enthusiastic market has grown wary of the B2C sector. Investors once eager to invest in what looked like the next big success have become more concerned about steering clear of the next big disaster. As a result, B2C companies' stock has fallen considerably.

They Said It...

"People think of Bill Shatner as the head of a starship from the future. That is a great image for the kinds of customers that we want and who understand that this is the way pricing is going to be done in the future."

-Jay Walker, Priceline vice president and founder, E-Commerce Times, Jan. 18, 2000.

Just the Facts!

The average DVD can hold 8 billion bytes of data. That's enough space to hold a three-hour video movie, or a stack of double-spaced type-written pages the height of the Empire State building.

■ **B2B.** Just as Wall Street was beginning to lose interest in e-commerce, a group of online companies that sell goods and services to other businesses caught its attention. B2B looked strong in the early part of the year and quickly became the apple of Wall Street's eye.

Lately, however, B2B companies have stumbled and fickle investors are becoming less enthusiastic. In the wake of some B2B failures, investors are starting to fear that the segment is becoming as crowded and competitive as the B2C segment. As the market becomes increasingly competitive, the number of probable casualties grows and makes investors skittish.

A B2B company is usually defined as a company that brings together buyers and sellers within a particular industry. For instance, an automotive B2B site might bring auto parts distributors and retailers together. But B2B companies also include e-commerce application vendors, ASPs (Application Service Providers), and Internet incubators.

■ **E-commerce Application Vendors.** E-commerce vendors provide the know-how and equipment to help a company move into online retail. E-commerce vendors such as BroadVision and Ariba are not exactly household names, but they are becoming big players within the e-commerce application market.

According to AMR Research, the e-commerce application market is still a developing one. The top companies managed to grab 45% of the market collectively, but not one of the top 10 managed to secure more than 7% of the market. AMR maintains that there's still plenty of room for growth here and expects the market to reach $16 billion by 2004.

AMR divides the e-commerce application market into four primary categories: procurement (Ariba), sell-side (BroadVision), trading exchanges (Oracle, Siebel Systems), and other. Currently, the top vendors each specialize in one of these primary segments. As companies begin to expand, they will probably move into other segments, resulting in more direct competition between businesses. AMR believes the trading exchange category will be one of the first to see heavy competition.

■ **Application Service Providers.** ASPs turn software from a product into a service by making it available over the Internet. In the ASP model, a user doesn't actually download the software, but rather runs it remotely over the Internet. This offers advantages in price and maintenance for a business, especially smaller businesses. For instance, a small business can pay a monthly service to use accounting software over the Internet instead of paying a hefty price to purchase a

software license. When a new version of the software is available, the ASP takes care of the upgrade, and the user doesn't have to shell out additional cash for the upgrade or worry about how to implement it. Furthermore, the ASP supports the software and ensures it's running correctly at all times, eliminating the need for a company to hire an on-site technical staff.

Although the segment is beginning to attract attention, it still has a ways to go. In June 2000, IDC conducted a survey of information technology professionals and found that a little more than half had heard the term "ASP." Fewer than 6% of those who had heard the term actually knew what it referred to.

By some accounts, growth in the ASP market will increase if more ASPs are successful in partnering with software companies. According to IDC, more than 80% of ASPs are now seeking partners. The potential for revenue could be short-lived, however, according to a recent report by Gartner Group. Gartner suggests that the current wave of new ASPs emerging is creating an increasingly crowded and competitive market. There are also concerns about the business plans of many ASPs: According to Gartner, many ASPs are spreading themselves too thin by offering too many services.

By the end of 2001, 60% of the current 480 ASPs are expected to fail. Mergers and acquisitions will likely swallow still more ASPs. By the end of 2004, only 20 of the 480 ASPs in business today are expected to be functioning on a large scale.

Customers are likely to feel the sting of ASP failures more acutely than they have B2C company closings. When a B2C site goes out of business, the average customer isn't out all that much. If a customer has recently made a purchase, the product often ships before the company closes or else the customer isn't charged for it. On the other hand, if the company you pay to provide you with accounting software closes its doors, your business must scramble to find another ASP. If 60% of all ASPs fail by the end of 2001 as projected, most businesses using ASPs will have to make transitions to new service providers at least once, and possibly more.

■ Internet Incubators. A company has to spend money to make money. Equipment, office space, and personnel are expenses a new company simply can't get around. The problem is how to get the capital you need to start the business.

Technology has helped to create more wealth, which in turn has helped to produce more venture capital to fund more companies. In 1997, startups received a little less than $11.5 billion in venture capital. By 1999, that number had grown to more than $35.5 billion

Internet incubators provide more than just capital in exchange for equity in a startup. According to the Aberdeen Group, the idea behind Internet incubators is similar to the idea behind Maslow's hierarchy of needs. In other words, the more mundane tasks an incubator can handle for a startup, the more time and energy a startup can focus on developing its product and getting it to market. Internet incubators may provide furnishings, office space, office equipment, supplies, staff, capital, business services (such as accounting), and—perhaps most importantly—market advice and information to help the new company be more competitive.

It's important to note that the key term here is "incubator." An Internet incubator is only supposed to house a company until it can stand on its own. Most of the time, a new business has a set amount of time to get up and running before it must find its own office space, equipment, and personnel. The incubator can then make these resources available to another company. Producing a large number of startups provides a measure of security for Internet incubators: Due to the risk involved in investing in startup companies, diversifying investments in as many startups as possible is the only way to reduce risk to a manageable level.

Just as the variety of services incubators provide differ widely, so do the deals incubators offer. In fact, deals can even vary within the same incubator depending on the business plan and the entrepreneur. Aberdeen differentiates between three different business models commonly used by incubators. Incubators operating under a long-term ownership model are seeking majority interest in a company on a long-term basis. In general, the long-term ownership model provides $500,000 to $1 million in capital, although occasionally the incubator

They Said It...

"In a startup society, huge sums can fall on innocent parties, almost by accident."

-cyberpunk novelist Bruce Sterling, Bespoke.org, Jan. 3, 2000.

Just the Facts!

There are more than 27 million domain names registered worldwide, and that number continues to grow. More than 17 million of those domain names end with .com. (Source: DomainStats.com)

Do You Know...

how many Internet companies ran advertisements during Super Bowl XXXIV?

Seventeen of the 47 companies that ran Super Bowl ads this year were dot coms, up from just three the previous year. A dot-com feeding frenzy over airtime pushed ad rates up to $2.2 million for each 30-second spot, and several Internet companies spent more on ad packages than they had generated in revenue. Computer.com, for example, spent about $3 million on one commercial during the big game and two during pregame network coverage. Prior to January 30, Computer.com had reportedly taken in less than $500,000 in revenue.

will simply pay a new company's expenses. The incubator will also secure later-round financing. In return, the incubator receives a 30% to 70% share in the company. The long-term goal is to sell the company off in a merger or go public.

The short-term investment model, on the other hand, offers enough financing to get a company running. This model usually provides between $250,000 and $500,000 in initial capital in return for a 10% to 30% stake in the company. The goal in this model is to secure later-round financing from the company.

A third alternative is a hybrid of the two previous models. In this case, the incubator's long-term position is decided on a case-by-case basis. Usually an incubator provides $250,000 to $500,000 in initial capital to the company in exchange for a 25% to 50% equity stake. The goal is usually future financing, but can occasionally be an IPO (initial public offering) or a sale of the company.

■ **P2P.** Investors have started looking excitedly at P2P sites, which connect individual users and open up new possibilities for e-commerce. P2P technology can enable users to share files or accept electronic payments over the Internet. PayPal, for instance, is a leading P2P site that allows users to send payments to other PayPal members using e-mail.

PayPal is also available over Internet-enabled cell phones and plans to extend its services to other wireless devices as well. The service currently boasts 3 million users.

P2P services are important to online business, because for the first time the average user has the ability to accept electronic payments. Small Web-based businesses, for instance, no longer have to pay extra to offer a credit card payment option, and online auction winners can submit electronic payments instead of mailing a check.

Still other companies, most notably Napster, are providing P2P technologies that allow individuals to share files online. In Napster's case, the company provides software that allows users to share MP3 digital music files with one another over the Internet. Napster is the source of much controversy and a court case—the Record Industry Association of America is suing the company for copyright infringement. Other file sharing software, such as Gnutella, connects individuals without relying on any one central database, and for this reason may prove more difficult to shut down than Napster.

It's unclear, though, how Napster expects to make money off its software. The software is available for free and Napster doesn't even support advertising.

P2P has applications in other nonbusiness fields, as well. Not-for-profit organizations, such as the SIDS (Sudden Infant Death Syndrome) Network, can use services such as PayPal to accept donations.

Other companies such as ProPay are also pioneering the P2P field. While both parties in a deal must have a PayPal account, ProPay allows an individual to accept credit cards directly, eliminating the need for a buyer to have a ProPay account.

It seems that Wall Street is beginning to operate on Internet time as its favorites change at a rapid pace. At the end of 1999, investors seemed fixated on the possibilities of the B2C segment. As the market grew more crowded and competition increased, it began to shy away from B2C investments and found a new pet, B2B businesses. Now, however, even B2B is rapidly becoming old news and the latest thing seems to be P2P. The question is how long P2P will be able to hold the imagination and attention of investors before they once again look elsewhere. RS

by Chad Denton

GUESS WHO?

He collected $350 for designing the Breakout game for Atari and, years later, gave Nintendo Gameboys to Mikhail Gorbachov and President Bush. Before co-founding a major computer company in 1976, he also designed calculator chips for Hewlett-Packard.

Answer: Steve Wozniak

Dates To Remember

On Nov. 29, 1975, Bill Gates first used the term Microsoft in a letter to Paul Allen. The two men joined forces with Rick Weiland that year to create a three-man company. That first year, Microsoft earned $16,005 in revenues.

Quick Tips

If you don't have to own the latest and greatest hardware, you can save on hardware upgrades. Price cuts are a regular part of the computer industry and sometimes signal a new line of high-end products. On the other hand, if you want high-end products regardless of cost, don't buy a product if a company announces price cuts. Odds are something new is on the way.

Quick Tips

You can often find great hardware deals online. Sites such as PriceWatch (http://www.pricewatch.com) let you compare prices from several online vendors to find the cheapest prices for the hardware and software you want. You might be able to find an item on sale for well below retail price. You will also most likely avoid paying taxes on the hardware and software you buy online. Most sites do charge for shipping and handling, but it's usually a better deal than paying the sales tax.

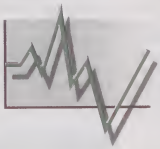
The Dot Coms At A Glance

At the end of last year, Internet stocks were a hot ticket. As the 2000 began, however, Internet stocks cooled considerably and some companies went under. The future remains uncertain for many dot coms. Here's a look at some of the trends in the e-commerce industry in 2000, including recent financial data for some of the better known online companies, dot-com stock price highs and lows, and projected growth in various online retail segments.

E-commerce Second Quarter

Quarterly Figures

Below are the second quarter figures for some of the most widely known dot coms. We've listed figures for revenues, marketing, development, and net income. Figures are from second quarter SEC filings and all figures are in millions of dollars.



Dot-Com 52-Week Range

The best way to observe the volatility of Internet stocks is to look at the highest and lowest stock prices over the last year. We tracked the stock highs and lows of some big name Internet companies. On average, the stocks listed below ranged from less than $10 to more than $45. All figures were current as of August 18, 2000.

Second Quarter 2000

Company Name	Symbol	Quarterly Revenue	Quarterly Marketing	Quarterly R&D	Quarterly Net	52-Week Low	52-Week High
Amazon.com	AMZN	$578	$130	$67	-$317	$27.875	$113
Autobytel.com	ATBL	$17	$18	$7	-$9	$4	$20.375
Autoweb.com	AWEB	$15	$13	$2	-$6	$1.50	$14.125
barnesandnoble.com	BNBN	$67	$32	$10	-$10	$3.438	$23.50
Beyond.com	BYND	$31	$10	$2	-$20	$0.781	$19.875
buy.com	BUYX	$193	$22	$6	-$34	$2.75	$35.438
CDnow.com	CDNW	$34	$11	$8	-$23	$2.031	$18.125
CDW	CDWC	$943	N/A	N/A	$40	$21.25	$74
CNET	CNET	$52	$23	$4	$21	$21.25	$29.875
Cyberian Outpost	COOL	$65	$11	$3	-$7	$3.063	$15.938
drugstore.com	DSCM	$25	$36	$7	-$55	$4.688	$67.50
eBay	EBAY	$97	$33	$12	$12	$43.50	$127.50
eToys.com	ETYS	$25	$30	$13	-$57	$3.875	$86
E*TRADE	EGRP	$330	$115	$33	$6	$13.125	$40
MP3.com	MPPP	$20	$12	$6	-$177	$6.50	$64.625
Pets.com	IPET	$9	$17	$2	-$24	$0.719	$14
PlanetRx.com	PLRX	$9	$21	$5	-$44	$0.563	$36.50
Priceline.com	PCLN	$352	$38	$7	-$5	$22.625	$104.250
Salon.com	SALN	$2	$2	$0.4	-$5	$1.063	$10.063
Tickets.com	TIXX	$15	$11	$4	-$55	$1.75	$32
Totals		**$2879**	**$585**	**$189**	**-$769**	**$186.346**	**$946.689**
Average	**$**	**$144**	**$31**	**$10**	**-$38**	**$9.32**	**$47.33**

E-commerce End Of Year

End Of Year Revenues

Listed below are end of year revenues for the last two years for popular dot coms that cover a variety of business models. Figures are from the company's annual reports. All numbers are in millions.

Development Expenses

Technology is obviously an important component for any Internet startup. Developing new technology and products is key to staying ahead of competitors. Figures below are from each company's annual SEC filings. All listings are in millions of dollars.

Marketing Expenses

Marketing is an important investment for any startup, but particularly for an Internet startup. In theory, the more a company spends on marketing, the bigger a company's potential for future revenues. Figures are from the companies' annual reports. All numbers are in millions.

Net Income

Given the youth of some of these Internet companies, it's not surprising that many are not yet profitable. Still, investors are beginning to become impatient as they watch some Internet companies slip further and further into the red despite increasing revenues.

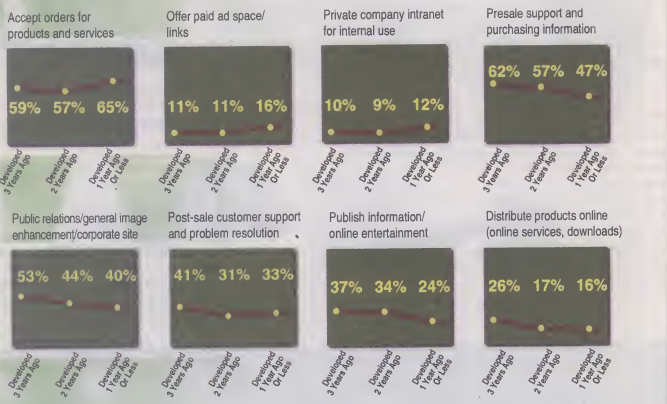
Latest Annual Reports

Company Name	Annual Revenue	Previous Revenue	Marketing Expenses	Previous Marketing Expenses	Development Expenses	Previous Development Expenses	Net Income	Previous Net Income
Amazon.com	$1,640	$610	$413	$133	$160	$47	-$720	-$124
Autobytel.com	$40	$24	$44	$30	$14	$9	-$23	-$19
Autoweb.com	$33	$13	$33	$14	$5	$0.6	-$18	-$12
Beyond.com	$117	$37	$81	$27	$10	$4	-$125	-$31
CDnow.com	$147	$56	$90	$45	$23	$8	-$119	-$44
CDW	$2,561	$1,733	N/A	N/A	N/A	N/A	$98	$65
CNET	$112	$57	$92	$15	$8	$3	$417	$3
Cyberian Outpost	$189	$85	$42	$27	$7	$4	-$36	-$25
drugstore.com	$35	N/A	$61	N/A	$15	N/A	-$116	N/A
eBay	$225	$86	$96	$36	$24	$5	$11	$7
eToys.com	$151	$30	$120	$21	$43	$4	-$190	-$29
E*TRADE	$657	$351	$321	$124	$77	$34	-$52	$3
MP3.com	$22	N/A	$24	N/A	$9	N/A	-$42	N/A
PlanetRx.com	$9	N/A	$55	$1	$13	$1	-$98	-$4
Priceline.com	$482	$35	$80	$24	$14	$11	-$1,055	-$112
Salon.com	$8	$3	$14	$3	$1	$0.4	-$22	-$6
Tickets.com	$46	$30	$35	$7	$13	$6	-$67	-$35
Totals	**$6,474**	**$3,150**	**$1,601**	**$507**	**$436**	**$137**	**-$2,157**	**-$363**
Average	**$381**	**$210**	**$100**	**$34**	**$27**	**$10**	**-$127**	**-$24**

*Company has not been public for more than two years.

Purposes For An Online Presence

As the Internet moves into the mainstream, companies are constantly re-evaluating their online strategies. As a result, the primary purpose for establishing a Web site has changed.


Accept orders for products and services
59% 57% 65%
Offer paid ad space/ links
11% 11% 16%
Private company intranet for internal use
10% 9% 12%
Presale support and purchasing information
62% 57% 47%
Public relations/general image enhancement/corporate site
53% 44% 40%
Post-sale customer support and problem resolution
41% 31% 33%
Publish information/ online entertainment
37% 34% 24%
Distribute products online (online services, downloads)
26% 17% 16%
Developed 3 Years Ago
Developed 2 Years Ago
Developed 1 Year Ago Or Less

SOURCE: ACTIVMEDIA RESEARCH "REAL NUMBERS BEHIND 'NET' PROFITS 2000"

Top 10 Sites

During The Month Of July

The more visitors a Web site generates, the more potential ad revenue it can receive. Listed below are the top 10 Web sites for the month of July by number of unique visitors. Numbers are in thousands.

	1. Yahoo!	2. America Online	3. Microsoft Network	4. Microsoft	5. MS Passport
June Rank	1	2	3	5	4
Web Site	yahoo.com	aol.com	msn.com	microsoft.com	passport.com
July Unique Users	52,212	46,114	41,153	31,907	31,469
% Change	5.7	10.5	4.9	7.9	6.4

	6. GeoCities	7. AOL Proprietary	8. Lycos	9. altavista	10. eBay
June Rank	6	7	9	8	11
Web Site	geocities.com	AOLProprietary.com	lycos.com	altavista.com	ebay.com
July Unique Users	30,846	29,411	20,718	20,507	18,954
% Change	9.2	7.6	5.4	1.3	8.1

SOURCE: PC DATA ONLINE JULY TOP 100

Top Internet Incubator Companies

Internet incubators offer cash and advice to young companies. In exchange for their investments and services, the incubator gets a piece of the company and may stand to make significant cash if the startup later goes public.

CMGI

Location: Andover, Mass.

Employees: 1,200

Portfolio Samples:

- 1stUp.com
- ICAST
- NaviSite
- CMGI Solutions

Idealab!

Location: Pasadena, Calif.

Employees: 70

Portfolio Samples:

- eToys.com
- GoTo.com
- WeddingChannel.com

Internet Capital Group

Location: Wayne, Pa.

Employees: 75

Portfolio Samples:

- AssetTRADE.com
- CourtLink
- e-Chemicals
- Residential Delivery Services

divine interVentures

Location: Lisle, Ill.

Employees: 350

Portfolio Samples:

- CapacityWeb.com
- iGive.com
- BeautyJungle.com
- BidBuyBuild.com

Safeguard Scientifics

Location: Wayne, Pa.

Employees: 90

Portfolio Samples:

- Nextone Communications
- Opus360
- SOTAS
- Vitts Networks

Online Retail Projections By Segment

Online revenue should grow dramatically over the next several years. The following numbers pinpoint what segments are set to grow the most. All figures are in thousands of dollars.

Convenience

Examples: Software, Apparel, Flowers, Video Games

1999 Revenue	2000 Revenue	2001 Revenue	2002 Revenue	2003 Revenue	2004 Revenue
$7,037	$13,492	$22,431	$38,624	$53,693	$69,107

Research

Computer Hardware, Appliances, Electronics

1999 Revenue	2000 Revenue	2001 Revenue	2002 Revenue	2003 Revenue	2004 Revenue
$11,414	$21,135	$33,816	$48,443	$65,912	$78,782

Replenishment

Health, Beauty, Food

1999 Revenue	2000 Revenue	2001 Revenue	2002 Revenue	2003 Revenue	2004 Revenue
$1,800	$4,128	$7,932	$14,061	$24,153	$36,592

Total U.S. Revenue From Online Retail

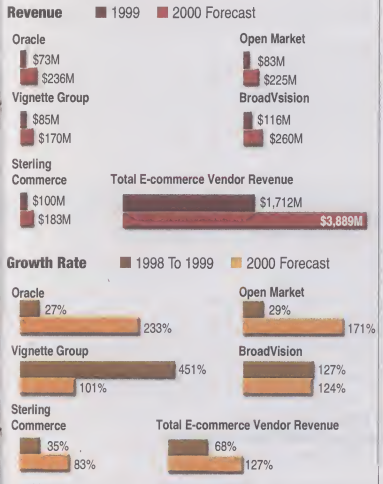
1999 Revenue	2000 Revenue	2001 Revenue	2002 Revenue	2003 Revenue	2004 Revenue
$20.252	$38.755	$64.179	$101.128	$143.758	$184.481

(All figures in billions of dollars)

Source: Forrester Research

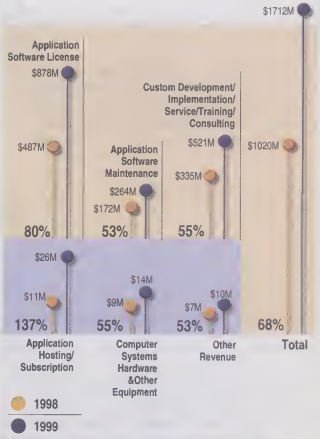
Top E-commerce Vendors By Projected 2000 Revenues

You may not recognize the names, but these companies sell the software, hardware, and services that online retailers need to track orders billing, shipping, and other information.



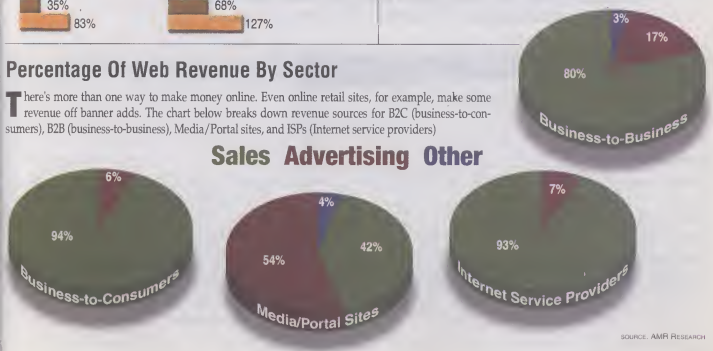
E-commerce Vendor Revenues

E-commerce vendors provide a variety of goods and services for online retailers. Below is a breakdown of e-commerce revenue sources.



Percentage Of Web Revenue By Sector

There's more than one way to make money online. Even online retail sites, for example, make some revenue off banner adds. The chart below breaks down revenue sources for B2C (business-to-consumers), B2B (business-to-business), Media/Portal sites, and ISPs (Internet service providers)



SOURCE: AMR RESEARCH

Taking Stock

Learn More About 100 Of Today's Top Technology Companies

High tech is in vogue, and much of that interest comes from the importance of technology in today's economy. Few stock market segments have experienced as much growth or generated as much investor interest as the computing industry has the past few years. As all types of businesses sought productivity gains through technology and consumers discovered the Web, demand for all things digital skyrocketed. The incredible stock market infatuation in the late 1990s with everything Internet related just added to the high-tech frenzy. By the end of 1999, it seemed as if high-tech stocks could only move in one direction: up.

Of course, markets have a way of correcting themselves, and the severe April 2000 stock market downturn popped the dreams of many would-be Internet moguls. Still, investors' overall enthusiasm for high-tech companies remains strong as Internet infrastructure, telecommunications, and wireless broadband sectors continue to grow rapidly. Digital technologies linked to personal computer use will have a great impact on the world's economies for years to come.

To help educate people about the computing industry, we compiled information on 100 of the best-known and most influential high-tech companies. This information will help you familiarize yourself with the companies that are driving digital technologies forward. Although we included stock performance data and financial results, this information is *not* for investment purposes. Instead, the data presented here should help you obtain a better understanding of which companies produce what types of products, how big those companies are, what areas of technology these companies are involved in, and how those companies are performing.

When choosing companies to include in our compilation, we looked at each corporation's size and revenue total, as well as its dominance in various technology sectors such as networking, e-commerce, consumer electronics, hardware, and telecommunications. The companies listed here are not necessarily incorporated or based in the United States, but their stocks are traded on U.S. stock exchanges. Hence, you may notice several major high-tech corporations, such as Acer, Mitsubishi, Samsung, and Toshiba, which trade stocks exclusively on foreigh exchanges, missing from this list.

We compiled company data from various sources including company annual reports, press releases, investment research sites, and corporate Web sites. Although we tried to provide up-to-date data for each company, some of the information listed below will have changed by the time you read this. Remember, this information is for *educational purposes only* and not for personal investing. If you do intend to invest in any of these companies, be sure to perform your own thorough research first. Some excellent sites for investment research include: BigCharts, MorningStar, MSN Investor, Hoover's, and Yahoo! Finance.

(NOTE: Special thanks to BigCharts.com for allowing us to reproduce the stock charts that you see on these pages.)

NOTE: In the financial information below, earnings per share is in U.S. dollars; market capitalization (based on 9/12 market price) and year-end revenue figures are in millions of U.S. dollars; and shares outstanding is in millions of shares.

3Com

Business description: Manufactures networking hardware-end software

Date founded: 1979

CEO: Eric A. Benhamou

Number of employees: 13,027

Primary products: Ethernets and hubs, broadband connections, handhelds (Palm), remote access equipment, IP telephony

Phone number: (800) 638-3266, (408) 326-5000

Street address: 5400 Bayfront Plaza, Santa Clara, CA 95052

Web address: http://www.3com.com

Competitors: Cabletron Systems, Cisco Systems, Lucent Technologies, Netopia, Nortel Networks

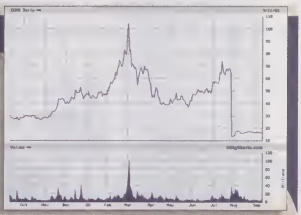


Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	6,000.0
Trading Symbol	COMS	**Shares Outstanding**	350.8
Fiscal Year-End	May	**Earnings Per Share**	$1.88
		Year-End Revenues	$4,333.9

3dfx Interactive

Business description: Manufactures graphic accelerator cards and devices

Date founded: 1994

CEO: Alex Leupp

Number of employees: 650

Primary products: Voodoo3, Voodoo4, Voodoo5 chipsets, Desktop TV, AGP and PCI cards, such as Voodoo5 6000 AGP and Voodoo5 5500 AGP

Phone number: (408) 935-4400

Street address: 4435 Fortran Drive, San Jose, Calif. 95134

Web address: http://www.3dfx.com

Competitors: 3Dlabs, ATI Technologies, Creative Technology, Matrox Graphics, NVIDIA

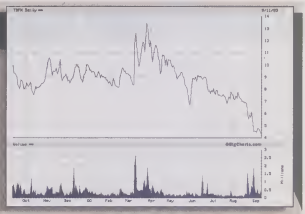


Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	118.6
Trading Symbol	TDFX	**Shares Outstanding**	24.6
Fiscal Year-End	January	**Earnings Per Share**	-$3.18
	Year-End Revenues	$360.5	

Adaptec

Business description: Designs and manufacturers hardware and software storage products and SCSI chips and boards

Date founded: 1981

CEO: Robert Stephens

Number of employees: 2,512

Primary products: Ultra160 SCSI (small computer systems interface) cards, Easy CD Creator Plus Deluxe, GoBack and ReZOOM system recovery and backup software

Phone number: (800) 442-7274, (408) 945-8600

Street address: 691 S. Milpitas Blvd., Milpitas, Calif. 95035

Web address: http://www.adaptec.com

Competitors: American Megatrends, Mylex, Oak Technology, Promise Technology, QLogic

Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	2,500.0
Trading Symbol	ADPT	**Shares Outstanding**	99.1
Fiscal Year-End	March	**Earnings Per Share**	$1.31
	Year-End Revenues	$811.2	

AMD

Business description: Microprocessor manufacturer

Date founded: 1969

CEO: W. J. Sanders III

Number of employees: 13,387

Primary products: K6 series, Athlon, and Duron CPUs (central processing units); E86 family of microcontrollers and microprocessors, non-volatile memory

Phone number: (800) 538-8450, (408) 732-2400

Street address: 1 AMD Place, Sunnyvale, Calif. 94086

Web address: http://www.amd.com

Competitors: Intel, Motorola, National Semiconductor, Transmeta

Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	10,500.0
Trading Symbol	AMD	**Shares Outstanding**	153.2
Fiscal Year-End	December	**Earnings Per Share**	$2.09
	Year-End Revenues	$2,857 (1999)	

Advent Software

Business description: Makes investment management software for advisers, banks, universities, and other organizations

Date founded: 1983

CEO: Peter Caswell

Number of employees: 603

Primary products: Advent office suite (which includes popular Axys accounting and reporting solution, Moxy financial software, Rex), Geneva, Qube, Rex

Phone number: (800) 727-0605, (415) 543-7696

Street address: 301 Brannan St., San Francisco, Calif. 94107

Web address: http://www.advent.com

Competitors: Automatic Data Processing (ADP), DST Systems, SunGard Data Systems, Thomson

Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	20,000.0
Trading Symbol	ADVS	**Shares Outstanding**	29.8
Fiscal Year-End	December	**Earnings Per Share**	$.67
Year-End Revenues	$101.6 (1999)		

Alcatel

Business description: Provides voice and data network products, support, and services

Date founded: 1895

CEO: Serge Tchuruk

Number of employees: 115,712

Primary products: Routers, switches, and optical and broadband networking products

Phone number: (U.S. headquarters) (800) 777-6804, (972) 519-3000

Street address: (U.S. headquarters) 1000 Coit Road, Plano, Texas 75075

Web address: http://www.alcatel.com

Competitors: Cisco Systems, Ericsson, Lucent, Nortel Networks, Siemens

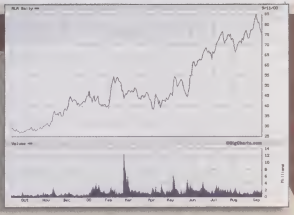


Chart Courtesy of www.bigcharts.com

Exchange	NYSE	**Market Capitalization**	16,600.0
Trading Symbol	ALA	**Shares Outstanding**	206.6
Fiscal Year-End	December	**Earnings Per Share**	$.69
Year-End Revenues	$ 23,235 (1999)		

Alltel

Business description: Telecommunications services provider

Date founded: 1954

CEO: Joe T. Ford

Number of employees: 24,440

Primary products: Long-distance services, Internet access, cell-phone services

Phone number: (501) 905-8000

Street address: One Allied Drive, Little Rock, Ark. 72202

Web address: http://www.alltel.com

Competitors: AT&T, BellSouth, SGC Communications, Sprint, Verizon Communications, WorldCom

Chart Courtesy of www.bigcharts.com

Exchange	NYSE	**Market Capitalization**	16,100.0
Trading Symbol	AT	**Shares Outstanding**	315.3
Fiscal Year-End	December	**Earnings Per Share**	$5.05
Year-End Revenues	$6,302 (1999)		

Amazon.com

Business description: Online e-tailer of consumer products

Date founded: 1995

CEO: Jeffrey P. Bezos

Number of employees: 7,600

Primary products: Selling books, CDs, DVDs (digital versatile discs), videos, and other merchandise, such as lawn and patio furnishings.

Phone number: (206) 266-1000

Street address: 1200 12th. Ave South, Suite 1200, Seattle, Wash. 98144

Web address: http://www.amazon.com

Competitors: bn.com (Barnes & Noble), buy.com, CDnow, DVD Express, eBay, eToys.com, EBworld.com, Yahoo! Auctions

Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	15,700.0
Trading Symbol	AMZN	**Shares Outstanding**	351.8
Fiscal Year-End	May	**Earnings Per Share**	-$2.90

Year-End Revenues $4,333.9

America Online

Business description: Internet service provider

Date founded: 1985

CEO: Stephen M. Case

Number of employees: 12,100

Primary products: AOL service, AOL Instant Messenger, AOL Digital City

Phone number: (800) 827-6364, (703) 265-1000

Street address: 22000 AOL Way, Dulles, Va. 20166

Web address: AT&T, Microsoft, Yahoo!

Competitors: AltaVista.com, AT&T WorldNet, Earthlink, Juno Online Services, MSN (Microsoft Network), Yahoo!

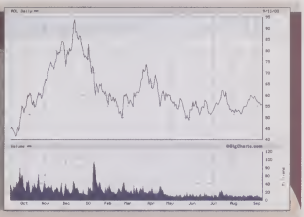


Chart Courtesy of www.bigcharts.com

Exchange	NYSE	**Market Capitalization**	129,200.0
Trading Symbol	AOL	**Shares Outstanding**	2,308.9
Fiscal Year-End	June	**Earnings Per Share**	$.48

Year-End Revenues $4,777 (1999)

APC

Business description: Manufacturer of power-protection equipment

Date founded: 1981

CEO: Rodger B. Dowdell Jr.

Number of employees: 5,920

Primary products: Surge protectors, network enclosures, power distributors, cable assemblies, uninterruptable power supplies

Phone number: (800) 788-2208, (401) 789-5735

Street address: 132 Fairgrounds Road, West Kingston, R.I. 02892

Web address: http://www.apcc.com

Competitors: Emerson, Invensys, Powerware

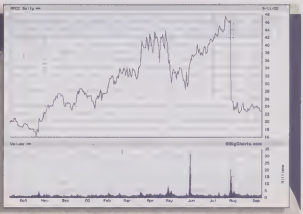


Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	4,600.0
Trading Symbol	APCC	**Shares Outstanding**	193.8
Fiscal Year-End	December	**Earnings Per Share**	$1.06

Year-End Revenues $1,337.3 (1999)

Ameritrade Holding

Business description: Online brokerage firm providing numerous financial services

Date founded: 1971

CEO: Joe Ricketts

Number of employees: 2,379

Primary products: Online trading, wireless trading services, financial planning tools, portfolio analysis

Phone number: (800) 237-8692, (402) 331-2744

Street address: 4211 South 102nd St., Omaha, Neb. 68127

Web address: http://www.ameritradeholding.com

Competitors: American Express Brokerage, Charles Schwab (Schwab.com), Datek Online, DLJDirect.com, E*Trade, TD Waterhouse

Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	3,300.0
Trading Symbol	AMTD	**Shares Outstanding***	174.6
Fiscal Year-End	September	**Earnings Per Share**	-$.13
Year-End Revenues	$315.3 (1999)		

Analog Devices

Business description: Manufactures and develops integrated circuits for signal-processing applications

Date founded: 1965

CEO: Ray Stata

Number of employees: 7,400

Primary products: Standard linear chips, digital signal processing ICs (Integrated circuits); products in categories such as amplifiers, audio, automatic test equipment, communications products, power management, and more

Phone number: (800) 262-5643, (781) 329-4700

Street address: One Technology Way, Norwood, Mass. 02062

Web address: http://www.analog.com

Competitors: MoSys, Motorola, STMicroelectronics, Texas Instruments

Chart Courtesy of www.bigcharts.com

Exchange	NYSE	**Market Capitalization**	32,200.0
Trading Symbol	ADI	**Shares Outstanding***	355.2
Fiscal Year-End	October	**Earnings Per Share**	$.92
Year-End Revenues	$1,450.4 (1999)		

Apple Computer

Business description: Hardware and software manufacturer for consumers and businesses

Date founded: 1976

CEO: Steve Jobs

Number of employees: 9,736

Primary products: iMac, Power Mac G4 Cube, Power Book G3, Mac OS 9, Mac OS X, QuickTime, Final Cut Pro, iMovie 2

Phone number: (800) 538-9696, (408) 996-1010

Street address: 1 Infinite Loop, Cupertino, Calif. 95014

Web address: http://www.apple.com

Competitors: Microsoft, Acer, Compaq, Dell, Gateway, Hewlett-Packard, IBM, Micron Electronics, Sun Microsystems

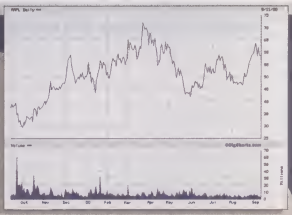


Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	19,800.0
Trading Symbol	AAPL	**Shares Outstanding**	325.5
Fiscal Year-End	May	**Earnings Per Share**	$3.83
Year-End Revenues	$6,134 (1999)		

At Home

Business description: Broadband Internet access provider and owner of Excite portal

Date founded: 1995

CEO: George Bell

Number of employees: 570

Primary products: Excite.com Web portal, @Home.com cable modem services, @Work.com, business services, Bluemountain.com

Phone number: (650) 556-5000

Street address: 450 Broadway St., Redwood City, Calif., 94063

Web address: http://www.home.net

Competitors: America Online, MSN (Microsoft Network), Time Warner, growth of DSL (Digital Subscriber Line) technology into common markets

Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	6,900.0
Trading Symbol	ATHM	**Shares Outstanding**	365.2
Fiscal Year-End	December	**Earnings Per Share**	-$3.99

Year-End Revenues $337.0 (1999)

ATI Technologies

Business description: Graphics accelerator chips and boards manufacturer for both Apple Macintosh and PC users

Date founded: 1985

CEO: Kwok Y Ho

Number of employees: 1,800

Primary products: RAGE and RADEON graphics chips are most current, but also Rage 128 Pro, Rage 128, TV/Video upgrades

Phone number: (905) 882-2600

Street address: 33 Commerce Valley Drive East, Thornhill, Ontario, L3T 7N6 Canada

Web address: http://www.ati.com

Competitors: 3dfx, 3Dlabs, Matrox Graphics, NVIDIA

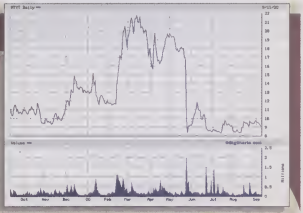


Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	2,100.0
Trading Symbol	ATYT	**Shares Outstanding**	218.1
Fiscal Year-End	August	**Earnings Per Share**	-$.04

Year-End Revenues $1,231.3 (1999)

AT&T

Business description: Telecommunications services provider

Date founded: 1877

CEO: C. Michael Armstrong

Number of employees: 148,000

Primary products: Long-distance, wireless, Internet access services

Phone number: (212) 387-5400

Street address: 32 Ave. of the Americas, New York, N.Y. 10013

Web address: http://www.att.com

Competitors: Cable and Wireless, SBC Communications, Sprint, Verizon Communications, WorldCom, Earthlink, Juno Online Services, MSN (Microsoft Network)

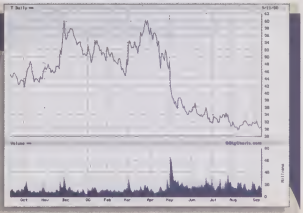


Chart Courtesy of www.bigcharts.com

Exchange	NYSE	**Market Capitalization**	115,700.0
Trading Symbol	T	**Shares Outstanding**	3,756
Fiscal Year-End	December	**Earnings Per Share**	$1.93

Year-End Revenues $62,391 (1999)

Broadcom

Business description: Manufactures silicon chips for voice, video, data transmissions, and networks

Date founded: 1991

CEO: Henry T. Nicholas III

Number of employees: 1,120

Primary products: Components for set-top boxes, broadband devices and networking

Phone number: (949) 450-8700

Street address: 16215 Alton Parkway, Irvine, Calif. 92618

Web address: http://www.broadcom.com

Competitors: Conexant Systems, Intel, Lucent Technologies, Texas Instruments

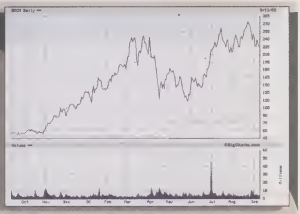


Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	29,600.0
Trading Symbol	BRCM	**Shares Outstanding**	121.3
Fiscal Year-End	December	**Earnings Per Share**	$.67
Year-End Revenues	$518.2 (1999)		

BroadVision

Business description: Publishes business software for use across networks

Date founded: 1993

CEO: Pehong Chen

Number of employees: 652

Primary products: Software for automating business commerce, supporting workgroup collaboration, handling finances, and distributing content

Phone number: (650) 261-5100

Street address: 585 Broadway, Redwood City, Calif. 94063

Web address: http://www.broadvision.com

Competitors: Allaire, ART Technology Group, Open Market, Oracle, SilverStream, Vignette

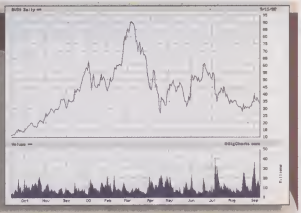


Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	8,900.0
Trading Symbol	BVSN	**Shares Outstanding**	249.9
Fiscal Year-End	December	**Earnings Per Share**	-$.13
Year-End Revenues	$115.5 (1999)		

Canon

Business description: Computer peripherals manufacturer

Date founded: 1937

CEO: Fujio Matarai

Number of employees: 79,800

Primary products: Bubble Jet printers, CanoScan scanners, Hyperphoto System digital production

Phone number: (For Canon U.S.A.) (516) 328-5000

Street address: (For Canon U.S.A.) One Canon Plaza, Lake Success, N.Y. 11042

Web address: http://www.canon.com

Competitors: Brother, Epson, Hewlett-Packard, Lexmark, Ricoh, Xerox

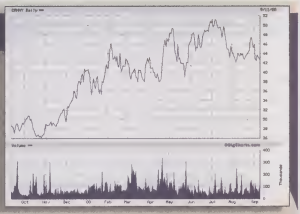


Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	37,800.0
Trading Symbol	CANNY	**Shares Outstanding**	871.1
Fiscal Year-End	December	**Earnings Per Share**	$.78
Year-End Revenues	$25,708 (1999)		

Cisco Systems

Business description: Produces networking hardware and software

Date founded: 1984

CEO: John Chambers

Number of employees: 21,000

Primary products: Networking products including routers, WAN solutions, LAN switches, IP telephony equipment

Phone number: (800) 553-6387, (408) 526-4000

Street address: 170 W. Tasman Drive, San Jose, Calif. 95134

Web address: http://www.cisco.com

Competitors: 3Com, Alcatel, Juniper Networks, Lucent, Nortel Networks, Sycamore Networks

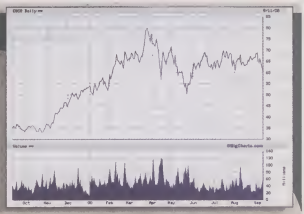


Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	464,900.0
Trading Symbol	CSCO	**Shares Outstanding**	7,023.8
Fiscal Year-End	July	**Earnings Per Share**	$.36

Year-End Revenues $12,154 (1999)

Comcast

Business description: Provider of broadband cable services and Internet access

Date founded: 1963

Chairman: Ralph J. Roberts

Number of employees: 25,700

Primary products: Comcast@Home modem and Internet access service, digital cable connection and service

Phone number: (215) 665-1700

Street address: 1500 Market St., Philadelphia, Pa. 19102

Web address: http://www.comcast.com

Competitors: AT&T Broadband, Cablevision Systems, Charter Communications, Cox Communications, Insight Communications, Time Warner

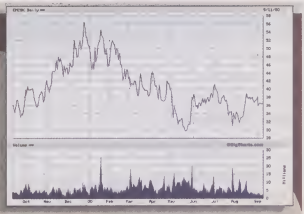


Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	31,600.0
Trading Symbol	CMCSK	**Shares Outstanding**	873.6
Fiscal Year-End	December	**Earnings Per Share**	$.95

Year-End Revenues $6,209 (1999)

Compaq Computer

Business description: Develops exhaustive line of desktop, handheld and network computers, as well as peripherals including storage products and printers

Date founded: 1982

CEO: Michael D. Capellas

Number of employees: 85,100

Primary products: Presario desktops and notebooks, DeskPro workstations, and disk, tape, and RAID (Redundant Array of Independent Disks) storage devices

Phone number: (800) 433-2391, (281) 370-0670

Street address: 20555 State Hwy. 249, Houston, Texas 77070

Web address: http://www.compaq.com

Competitors: Canon, Dell Computer, Gateway, Handspring, Hewlett-Packard, IBM, Labtec, Micron, Palm, Xerox

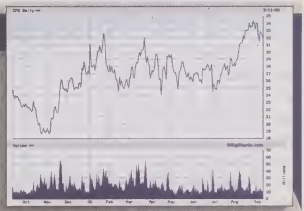


Chart Courtesy of www.bigcharts.com

Exchange	NYSE	**Market Capitalization**	55,600.0
Trading Symbol	CPQ	**Shares Outstanding**	1,698
Fiscal Year-End	December	**Earnings Per Share**	$.68

Year-End Revenues $38,525 (1999)

Computer Associates International

Business description: Offers network, e-commerce software and ASP services

Date founded: 1976

CEO: Charles B. Wang

Number of employees: 21,000

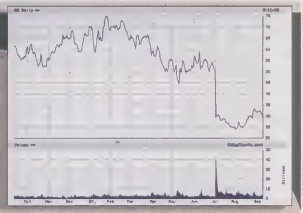
Primary products: eTrust, Jasmine II, Neugents, Unicenter TNG, Network IT programs

Phone number: (800) 225-5224, (631) 342-5224

Street address: 1 Computer Associates Plaza, Islandia, N.Y. 11749

Web address: http://www.cai.com

Competitors: BMC Software, Compuware, IBM, Microsoft, Oracle



Exchange	NYSE	**Market Capitalization**	19,200.0
Trading Symbol	CA	**Shares Outstanding**	592.9
Fiscal Year-End	March	**Earnings Per Share**	$2.13
	Year-End Revenues	$6,103	

Conexant Systems

Business description: Provides semiconductors and systems for communications electronics

Date founded: 1999

CEO: Dwight W. Decker

Number of employees: 8,000

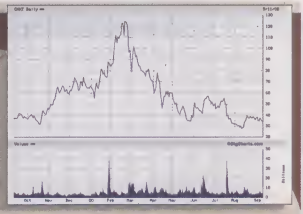
Primary products: Devices enabling wireless communications, digital imaging, and network/broadband systems

Phone number: (949) 483-4600

Street address: 4311 Jamboree Road, Newport Beach, Calif. 92660

Web address: http://www.conexant.com

Competitors: Broadcom, Lucent Technologies, Siemens, Texas Instruments



Exchange	Nasdaq	**Market Capitalization**	8,000.0
Trading Symbol	CNXT	**Shares Outstanding**	217.5
Fiscal Year-End	September	**Earnings Per Share**	$.07
	Year-End Revenues	1,444.1 (1999)	

Creative Technology

Business description: Maker of PC sound cards, graphic accelerators, MP3 players

Date founded: 1981

CEO: Sim Wong Hoo

Number of employees: 4,000

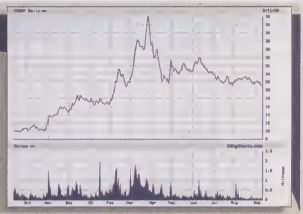
Primary products: Sound Blaster cards, digital music devices, video cards, and peripherals

Phone number: (408) 428-6600

Street address: Creative Labs (U.S. subsidiary), 1901 McCarthy Blvd., Milpitas, Calif. 95035

Web address: http://www.creative.com

Competitors: 3dfx, 3Dlabs, ATI Technologies, NVIDIA, S3



Exchange	Nasdaq	**Market Capitalization**	2,000.0
Trading Symbol	CREAF	**Shares Outstanding**	92.9
Fiscal Year-End	June	**Earnings Per Share**	$1.84
	Year-End Revenues	$1,296.5 (1999)	

Datalink

Business description: Provides network storage products, services, and support

Date founded: 1958

CEO: Greg R. Meland

Number of employees: 135

Primary products: Tape, RAID (Redundant Array of Independent Disks), optical, and CD-ROM storage devices and storage management software

Phone number: (800) 448-6314, (952) 944-3462

Street address: 7423 Washington Ave. South, Minneapolis, Minn. 55439

Web address: http://www.datalink.com

Competitors: Dot Hill, EMC, IBM, MTI Technology, Sun Microsystems

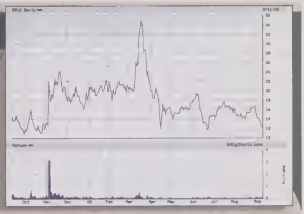


Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	123.2
Trading Symbol	DTLK	**Shares Outstanding**	8.773
Fiscal Year-End	December	**Earnings Per Share**	$.62

Year-End Revenues $118.9 (1999)

Dell Computer

Business description: Top manufacturer of PCs; leads the market in direct PC sales; also manufactures peripherals such as network storage products

Date founded: 1984

CEO: Michael Dell

Number of employees: 36,500

Primary products: Optiplex and Dimension systems, as well as servers and notebook PCs

Phone number: (800) 289-3355, (512) 338-4400

Street address: One Dell Way, Round Rock, Texas 78682

Web address: http://www.dell.com

Competitors: Compaq, Gateway, Hewlett-Packard, IBM, Micron

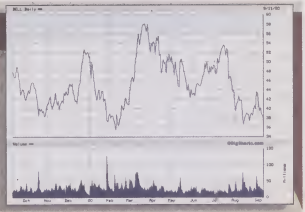


Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	103,600.0
Trading Symbol	DELL	**Shares Outstanding**	2,587.1
Fiscal Year-End	January	**Earnings Per Share**	$.64

Year-End Revenues $25,265

EarthLink

Business description: Internet service provider

Date founded: 1994

CEO: Garry Betty

Number of employees: 4,828

Primary products: EarthLink Internet service, EarthLink DSL, EarthLink StarterSite

Phone number: (404) 815-0770

Street address: 1430 W. Peachtree St., Suite 400, Atlanta, Ga. 30309

Web address: http://www.earthlink.net

Competitors: AOL, AT&T, MSN, NetZero, Yahoo!

Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	1,600.0
Trading Symbol	ELNK	**Shares Outstanding**	126
Fiscal Year-End	December	**Earnings Per Share**	-$2.31

Year-End Revenues 670.4 (1999)

Eastman Kodak

Business description: Manufactures digital and traditional cameras, film, and other imaging products

Date founded: 1892

CEO/Chairperson: Daniel A. Carp

Number of employees: 80,650

Primary products: digital cameras, scanners, multimedia software, other imaging hardware

Phone number: (800) 242-2424, (716) 724-4000

Street address: 343 State St., Rochester, N.Y. 14650

Web address: http://www.kodak.com

Competitors: Agfa, Canon, Epson, Fuji Photo Film, Nikon, Olympus, Polaroid, Sony

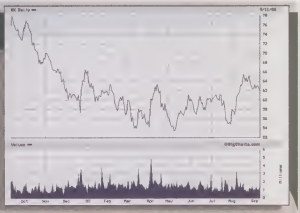


Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	19,400.0
Trading Symbol	EK	**Shares Outstanding**	310.0
Fiscal Year-End	December	**Earnings Per Share**	$4.77

Year-End Revenues $14,089 (1999)

eBay

Business description: Online auction service

Date founded: 1995

CEO: Margaret C. Whitman

Number of employees: 138

Primary products: Auction services, eBay Community

Phone number: (408) 558-7400

Street address: 2145 Hamilton Ave., San Jose, Calif. 95125

Web address: http://www.ebay.com

Competitors: Amazon.com, Boxlot, Egghead.com, uBid, Yahoo! Auctions

Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	17,300.0
Trading Symbol	EBAY	**Shares Outstanding**	262.5
Fiscal Year-End	December	**Earnings Per Share**	$.06

Year-End Revenues $224.7 (1999)

Eidos Interactive

Business description: Video and PC games publisher

Date founded: 1990

CEO: Charles H.D. Cornwall

Number of employees: 544

Primary products: Commandos, Fighting Force, Final Fantasy 7, Tomb Raider

Phone number: (Eidos Interactive) (415) 547-1200

Street address: (Eidos Interactive) 651 Brannan St., 4th Floor, San Francisco, Calif. 94107

Web address: www.eidos.com

Competitors: Electronic Arts, Havas Interactive, Infogrames, Interplay, Nintendo, Sony

Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	597.4
Trading Symbol	EIDSY	**Shares Outstanding**	91.9
Fiscal Year-End	March	**Earnings Per Share**	$.44

Year-End Revenues $310.4

Electronic Arts

Business description: Video and PC game publisher and developer

Date founded: 1982

CEO/Chairperson: Lawrence F. Probst III

Number of employees: 3,100

Primary products: EA Sports titles, Need For Speed series, Sim games, Ultima Online

Phone number: (650) 628-1500

Street address: 209 Redwood Shores Parkway, Redwood City, Calif. 94065

Web address: http://www.ea.com

Competitors: Activision, Eidos Interactive, Havas Interactive, Infogrames, Interplay

Exchange	Nasdaq	**Market Capitalization**	6,900.0
Trading Symbol	ERTS	**Shares Outstanding**	64.2
Fiscal Year-End	March	**Earnings Per Share**	$1.07
		Year-End Revenues	$1,420

eMachines

Business description: PC and peripheral component distributor

Date founded: 1998

CEO: Hong Soon Lee

Number of employees: 61

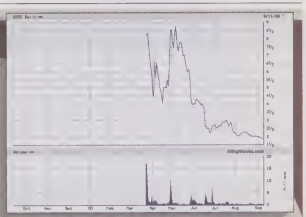
Primary products: eSlate, eMonster desktop systems

Phone number: (714) 481-2828

Street address: 14350 Myford Rd., Suite 100, Irvine, Calif. 92606

Web address: http://www.e4me.com

Competitors: Apple Computer, Compaq, Dell, Gateway, Hewlett-Packard, Micron



Exchange	Nasdaq	**Market Capitalization**	275.8
Trading Symbol	EEEE	**Shares Outstanding**	144.7
Fiscal Year-End	December	**Earnings Per Share**	-$3.94
		Year-End Revenues	$814.3 (1999)

EMC

Business description: Leading manufacturer of mainframe computer disks, memory hardware, and software

Date founded: 1979

CEO: Michael C. Ruettgers

Number of employees: 17,700

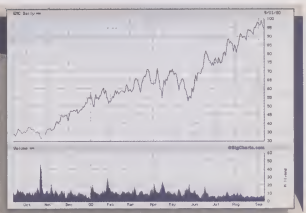
Primary products: Storage systems, networking products, storage software, infrastructure services

Phone number: (877) 362-6973, (508) 435-1000

Street address: 35 Parkwood Drives, Hopkinton, Mass. 01748

Web address: http://www.emc.com

Competitors: Compaq, Hitachi, IBM, NEC



Exchange	NYSE	**Market Capitalization**	210,700.0
Trading Symbol	EMC	**Shares Outstanding**	2,180
Fiscal Year-End	December	**Earnings Per Share**	$.57
		Year-End Revenues	$6,716 (1999)

Ericsson

Business description: Mobile phone infrastructure and equipment

Date founded: 1994

CEO: Lars Ramqvist

Number of employees: 103,290

Primary products: Mobile phones, wireless Internet products, and networking devices

Phone number: (212) 685-4030

Street address: 100 Park Ave., Suite 2705, New York, N.Y. 10017

Web address: http://www.ericsson.com

Competitors: Lucent, Motorola, Nokia

Exchange	Nasdaq	**Market Capitalization**	146,000.0
Trading Symbol	ERICY	**Shares Outstanding**	7,165.7
Fiscal Year-End	December	**Earnings Per Share**	$.73
		Year-End Revenues	$25,267 (1999)

E*Trade Group

Business description: Online brokerage firm

Date founded: 1982

CEO: Christos M. Cotsakos

Number of employees: 1,735

Primary products: Online trading, banking, and other financial services

Phone number: (650) 331-6000

Street address: 4500 Bohannon Drive, Menlo Park, Calif. 94025

Web address: http://www.etrade.com

Competitors: Ameritrade, The Charles Schwab Corporation, Datek Online, TD Waterhouse

Exchange	Nasdaq	**Market Capitalization**	5,500.0
Trading Symbol	EGRP	**Shares Outstanding**	291.7
Fiscal Year-End	September	**Earnings Per Share**	-$.22
		Year-End Revenues	$682.3 (1999)

Exodus Communications

Business description: Provider of enterprise-class Internet hosting services and network management

Date founded: 1994

CEO: Ellen M. Hancock

Number of employees: 1,700

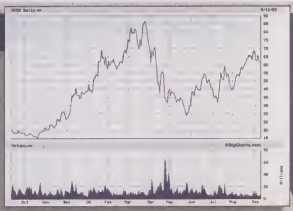
Primary products: Internet Data Center service, consultation, Web-site monitoring, security technology

Phone number: (408) 346-2200

Street address: 2831 Mission College Blvd., Santa Clara, Calif. 95054

Web address: http://www.exodus.net

Competitors: AboveNet Communications, Data Return, Worldcom IDT Corporation



Exchange	Nasdaq	**Market Capitalization**	26,000.0
Trading Symbol	EXDS	**Shares Outstanding**	412.4
Fiscal Year-End	December	**Earnings Per Share**	-$.48
		Year-End Revenues	$242.1 (1999)

Flextronics International

Business description: Provides services, facilities, and product design work to OEMs (original equipment manufacturers) in the technology industry

Date founded: 1987

CEO: Michael E. Marks

Number of employees: 49,000

Primary products: Full-service design, manufacturing, and distributing operations

Phone number: (Regional Headquarters) (408) 576-7000

Street address: (Regional Headquarters) 2090 Fortune Drive, San Jose, Calif. 95131

Web address: http://www.flextronics.com

Competitors: Celestica, C-Mac Industries, Jabil Circuit, Sanmina, SCI Systems, Solectron

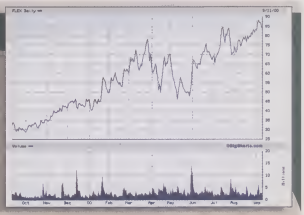


Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	17,500.0
Trading Symbol	FLEX	**Shares Outstanding**	193.7
Fiscal Year-End	March	**Earnings Per Share**	-$1.06
Year-End Revenues	$5,740		

Gateway

Business description: Manufactures PC desktops, notebooks, and accessories

Date founded: 1985

CEO: Jeffrey Weitzen

Number of employees: 21,000

Primary products: Desktops, notebooks, remanufactured systems, network servers

Phone number: (800) 846-2000; (858) 799-3401

Street address: 4545 Towne Center Court, San Diego, Calif. 92121

Web address: http://www.gateway.com

Competitors: Compaq, Dell Computer, Hewlett-Packard, Micron Technology

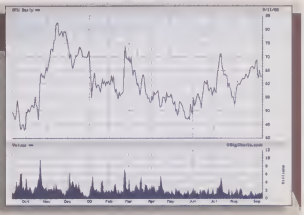


Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	20,700.0
Trading Symbol	GTW	**Shares Outstanding**	321.8
Fiscal Year-End	December	**Earnings Per Share**	$1.51
Year-End Revenues	$8,646 (1999)		

Handspring

Business description: Manufacturers handheld computing products

Date founded: 1998

CEO: Donna L. Dubinsky

Number of employees: 114

Primary products: Visor Deluxe/Prism/Platinum PDAs, Springboard modules, accessories

Phone number: (650) 230-5000

Street address: 189 Bernardo Ave., Mountain View, Calif. 94043

Web address: http://www.handspring.com

Competitors: Casio Computer, Compaq, Hewlett-Packard, Palm, Psion, Sony

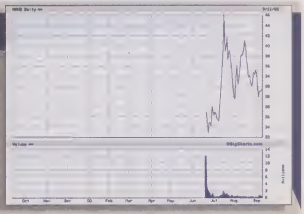


Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	3,900.0
Trading Symbol	HAND	**Shares Outstanding**	125.3
Fiscal Year-End	June	**Earnings Per Share**	-$4.71
Year-End Revenues	$101.9		

Hasbro Interactive

Business description: Manufactures computer and board games/other entertainment products

Date founded: 1923

CEO: Alan G. Hassenfeld

Number of employees: 9,500

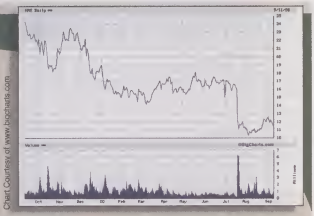
Primary products: Scrabble, Monopoly, Play-Doh, Pokemon cards, NASCAR and Frogger computer games

Phone number: (401) 431-8697

Street address: 1027 Newport Ave., Pawtucket, R.I. 02861

Web address: http://www.Hasbro.com

Competitors: LEGO, Mattel, Sony, Infogrames Entertainment, Havas Interactive, Eidos Interactive, Electronic Arts



Exchange	Nasdaq	**Market Capitalization**	2,000.0
Trading Symbol	HAS	**Shares Outstanding**	172.1
Fiscal Year-End	December	**Earnings Per Share**	$.83
		Year-End Revenues	$4,232.3 (1999)

Hewlett-Packard

Business description: Maker of printers, scanners, copiers, desktops, and accessories

Date founded: 1939

CEO: Carleton S. Fiorina

Number of employees: 84,400

Primary products: Vectra desktops, ScanJet scanners, DeskJet printers

Phone number: (800) 222-5547, (650) 857-1501

Street address: 3000 Hanover St., Palo Alto, Calif. 94304

Web address: http://www.hp.com

Competitors: Canon, Compaq, Dell Computer, Epson, IBM, Micron Electronics, Xerox

Exchange	Nasdaq	**Market Capitalization**	123,300.0
Trading Symbol	HWP	**Shares Outstanding**	997.0
Fiscal Year-End	October	**Earnings Per Share**	$2.95
		Year-End Revenues	$42,370 (1999)

Hitachi

Business description: Manufactures electronics, computers, semiconductors, and industrial equipment

Date founded: 1910

CEO: Etsuhiko Shoyama

Number of employees: 337,911

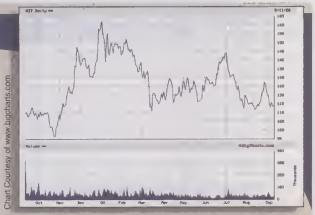
Primary products: DVD-ROM drives, storage products, monitors, plasma displays

Phone number: (U.S. headquarters) (800) 448-2244, (650) 589-8300

Street address: (U.S. headquarters) 2000 Sierrra Point Parkway, Brisbane, Calif. 94005

Web address: http://www.hitachi.com

Competitors: Amdahl, Fujitsu, Matsushita, Mitsubishi, Sony, NEC, Toshiba, Samsung



Exchange	Nasdaq	**Market Capitalization**	38,700.0
Trading Symbol	HIT	**Shares Outstanding**	333.8
Fiscal Year-End	March	**Earnings Per Share**	$.48
		Year-End Revenues	$748

IBM

Business description: Manufactures hardware and software for businesses and individual computer users; provides wide range of technical services and consulting

Date founded: 1911

CEO and Chairperson: Louis V. Gerstner, Jr.

Number of employees: 307,401

Primary products: ThinkPad notebooks, WorkPad handhelds, Intellistation workstations, Intel- and Unix-based network servers and mainframes, Lotus software

Phone number: (800) 426-4968, (914) 499-1900

Street address: New Orchard Road, Armonk, N.Y. 10504

Web address: http://www.ibm.com

Competitors: Anderson Consulting, Compaq, Dell, Hewlett-Packard, Microsoft, Toshiba

Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	235,100.0
Trading Symbol	IBM	**Shares Outstanding**	1,772.8
Fiscal Year-End	December	**Earnings Per Share**	$3.96

Year-End Revenues $87,548 (1999)

Imation

Business description: Manufactures imaging and digital information storage, handling, and transfer products

Date founded: 1996

CEO: William T. Monahan

Number of employees: 4,850

Primary products: SLR data cartridges, Black Watch tapes and cartridges, SuperDisk products

Phone number: (888) 466-3456, (651) 704-4000

Street address: 1 Imation Place, Oakdale, Minn. 55128

Web address: http://www.imation.com

Competitors: Datalink, Iomega, Seagate, Quantum

Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	799.4
Trading Symbol	IMN	**Shares Outstanding**	35.7
Fiscal Year-End	December	**Earnings Per Share**	$1.70

Year-End Revenues $1,412.6 (1999)

Infineon Technologies

Business description: Industrial semiconductor and communications component manufacturer

Date founded: 1999

CEO: Ulrich Schumacher

Number of employees: 26,000

Primary products: Components for memory, wireless communications, sensors, fiber optics, consumer electronics

Phone number: (U.S. headquarters) (408) 501-6000

Street address: (U.S. headquarters) 1730 North First St., San Jose, Calif. 95112

Web address: http://www.infineon.com

Competitors: Hitachi, Motorola, Philips Electronics, STMicroelectronics

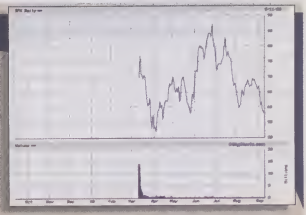


Chart Courtesy of www.bigcharts.com

Exchange	NYSE	**Market Capitalization**	37,400.0
Trading Symbol	IFX	**Shares Outstanding**	616.7
Fiscal Year-End	September	**Earnings Per Share**	$.11

Year-End Revenues $4,543.6

InfoSpace

Business description: Online content provider

Date founded: 1996

CEO: Arun Sarin

Number of employees: 450

Primary products: Wireless Internet Services, Merchant Services

Phone number: (425) 201-6100

Street address: 15375 NE 90th St., Redmond, Wash. 98052

Web address: http://www.infospace.com

Competitors: AT&T, ePresence, InfoUSA, Novell, Eperian,

Exchange	Nasdaq	**Market Capitalization**	9,600.0
Trading Symbol	INSP	**Shares Outstanding**	229.5
Fiscal Year-End	December	**Earnings Per Share**	-$.48
		Year-End Revenues	$36.9 (1999)

Intel

Business description: Makes CPUs, chipsets, and networking products

Date founded: 1968

CEO and president: Craig R. Barrett

Number of employees: 70,200

Primary Products: Hardware. Celeron, Pentium III, and Pentium 4 central processing units

Phone number: (800) 628-8686, (408) 765-8080

Street address: 2200 Mission College Blvd., Santa Clara, Calif. 95052

Web address: http://www.intel.com

Competitors: AMD, Broadcom, IBM, Motorola, Transmeta (for mobile chips)

Exchange	Nasdaq	**Market Capitalization**	453,000.0
Trading Symbol	INTC	**Shares Outstanding**	3,349
Fiscal Year-End	December	**Earnings Per Share**	$2.69
		Year-End Revenues	$29,389 (1999)

Intergraph

Business description: Computing solutions, integration, services, consulting, and hardware for Windows NT and 2000 systems

Date founded: 1969

CEO: James F. Taylor, Jr.

Number of employees: 5,700

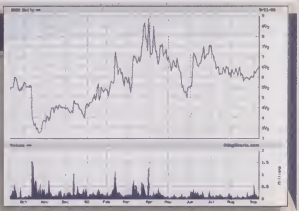
Primary products: Workstations, servers, monitors, video plug-ins, Wahoo technology

Phone number: (800) 345-4856, (256) 730-2000

Street address: Corporate Headquarters, Huntsville, Ala. 35894

Web address: http://www.intergraph.com

Competitors: Dassault, Hewlett-Packard, Intel, SGI



Exchange	Nasdaq	**Market Capitalization**	306.6
Trading Symbol	INGR	**Shares Outstanding**	49.3
Fiscal Year-End	December	**Earnings Per Share**	-$1.08
		Year-End Revenues	$914.9 (1999)

Intuit

Business description: Creates financial software for computer users

Date founded: 1983

CEO: Stephen M. Bennett

Number of employees: 4,025

Primary products: Quicken personal finance and TurboTax programs, QuickBooks Pro

Phone number: (650) 944-6000

Street address: 2535 Garcia Ave., Mountain View, Calif. 94043

Web address: http://www.intuit.com

Competitors: ADP, H&R Block, Jackson Hewitt, Microsoft, Paychex

Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	12,000.0
Trading Symbol	INTU	**Shares Outstanding**	203.4
Fiscal Year-End	July	**Earnings Per Share**	$2.72

Year-End Revenues $847.6 (1999)

Iomega

Business description: Manufactures storage products

Date founded: 1980

CEO: Bruce Albertson

Number of employees: 3,907

Primary products: Zip and Jaz drives and disks, Buz multimedia producer, Ditto back-up products

Phone number: (801) 332-3585

Street address: 1821 W. Iomega Way, Roy, Utah 84067

Web address: http://www.iomega.com

Competitors: Imation, ORB, Quantum, Seagate, Sony

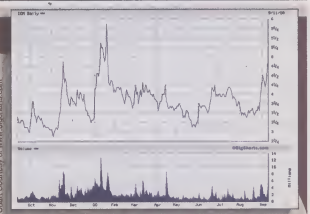


Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	1,200.0
Trading Symbol	IOM	**Shares Outstanding**	270.6
Fiscal Year-End	December	**Earnings Per Share**	$.12

Year-End Revenues $1,525.1 (1999)

Jabil Circuit

Business description: Electronics manufacturing services for communications, computers, and consumer industries

Date founded: 1966

CEO: William D. Morean

Number of employees: 6,554

Primary products: Circuit and board design, volume board and system assembly design, repair services

Phone number: (727) 577-9749

Street address: 10560 Ninth St. North, St. Petersburg, Fla. 33716

Web address: http://www.jabil.com

Competitors: Celestica, Flextronics, SCI Systems, Sanmina, Solectron

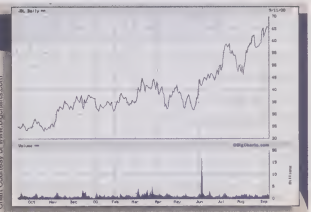


Chart Courtesy of www.bigcharts.com

Exchange	NYSE	**Market Capitalization**	12,300.0
Trading Symbol	JBL	**Shares Outstanding**	189.9
Fiscal Year-End	August	**Earnings Per Share**	$.72

Year-End Revenues $2,000.3 (1999)

Lernout & Hauspie Speech Products

Business description: Speech & language technology manufacturer and distributor

Date founded: 1987

CEO: Gaston Bastiaens

Number of employees: 2,000

Primary products: iTranslator, Voice Xpress, RealSpeak, Dragon Naturally Speaking Kurzweil 1000 & 3000

Phone number: (781) 203-5000

Street address: 52 Third Ave., Burlington, Mass. 01803

Web address: http://www.lhsl.com

Competitors: ALPNET, Browne, IBM

Exchange	Nasdaq	**Market Capitalization**	4,000.0
Trading Symbol	LHSP	**Shares Outstanding**	142.0
Fiscal Year-End	December	**Earnings Per Share**	$.39
		Year-End Revenues	$344.9 (1999)

Lexmark International Group

Business description: Manufactures printers and printer supplies

Date founded: 1991

CEO/Chairperson: Paul J. Curlander

Number of employees: 10,900

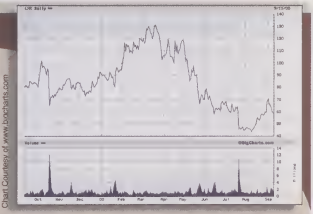
Primary products: Optra laser printers, Lexmark inkjet printers, refurbished printers

Phone number: (800) 539-6275, (859) 232-2000

Street address: One Lexmark Centre Drive, 740 W. New Circle Road, Lexington, Ky. 40550

Web address: http://www.lexmark.com

Competitors: Brother, Canon, Epson, Xerox, Hewlett-Packard



Exchange	NYSE	**Market Capitalization**	8,300.0
Trading Symbol	LXK	**Shares Outstanding**	129.2
Fiscal Year-End	December	**Earnings Per Share**	$2.50
		Year-End Revenues	$3,452.3 (1999)

Logitech International

Business description: Manufactures computer input devices, PC video cameras, and speakers

Date founded: 1981

CEO/President: Guerrino De Luca

Number of employees: 4,170

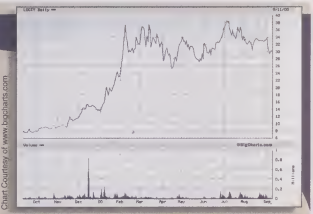
Primary products: Wingman Force joystick, Wheel Mouse, Cordless Desktop Pro keyboard, Ifeel Mouse, QuickCam video cameras, SoundMan speaker systems

Phone number: (800) 231-7717, (510) 795-8500

Street address: 6505 Kaiser Drive, Fremont, Calif. 94555

Web address: http://www.logitech.com

Competitors: C&H Products, IBM, Key Tronic, Microsoft



Exchange	Nasdaq	**Market Capitalization**	1,200.0
Trading Symbol	LOGIY	**Shares Outstanding**	40.0
Fiscal Year-End	March	**Earnings Per Share**	$.15
		Year-End Revenues	$615.7

Lucent Technologies

Business description: Manufactures networking and telecommunication products

Date founded: 1872

CEO: Richard A. McGinn

Number of employees: 153,000

Primary products: Internetworking systems and services, WAN access, integrated circuitry

Phone number: (888) 458-2368, (908) 582-8500

Street address: 600 Mountain Ave., Murray Hill, N.J. 07974

Web address: http://www.lucent.com

Competitors: Alcatel, 3COM, Cisco Systems, Juniper Networks, Nortel Networks

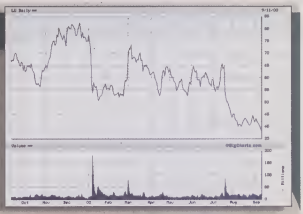


Chart Courtesy of www.bigcharts.com

Exchange	NYSE	**Market Capitalization**	140,000.0
Trading Symbol	LU	**Shares Outstanding**	3,228.4
Fiscal Year-End	September	**Earnings Per Share**	$1.16

Year-End Revenues $38,303 (1999)

Macromedia

Business description: Publishes Web design and multimedia software products

Date founded: 1992

CEO/Chairperson: Robert K. Burgess

Number of employees: 1,003

Primary products: Dreamweaver, Generator, Fireworks, FreeHand, Flash, Shockwave Player

Phone number: (800) 756-9603, (415) 252-2000

Street address: 600 Townsend St., Suite 310, San Francisco, Calif. 94103

Web address: http://www.macromedia.com

Competitors: Adobe, MetaCreations, Microsoft, Quark

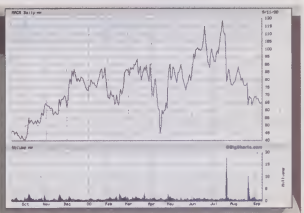


Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	3,400.0
Trading Symbol	MACR	**Shares Outstanding**	51.9
Fiscal Year-End	March	**Earnings Per Share**	$.30

Year-End Revenues $264.2

Matsushita Electric Industrial

Business description: Manufacturer of home, office, industrial, and commercial electronic devices

Date founded: 1918

CEO/Chairman: Yoichi Morishita

Number of employees: 282,000

Primary products: Panasonic, Quasar, and JVC VCRs, DVDs, Printers, Disk Drives, TVs

Phone numbers : (North American Headquarters) (201) 348-7000

Street address: (North American Headquarters) One Panasonic Way, Secaucus, N.J. 07094

Web address: http://www.panasonic.com

Competitors: Hitachi, IBM, Philips Electronics, Samsung, Sony

Chart Courtesy of www.bigcharts.com

Exchange	NYSE	**Market Capitalization**	53,800.0
Trading Symbol	MC	**Shares Outstanding**	206.2
Fiscal Year-End	March	**Earnings Per Share**	$.45

Year-End Revenues $68,862

Maxtor

Business description: Manufactures digital storage hardware

Date founded: 1982

CEO: Michael R. Cannon

Number of employees: 5,130

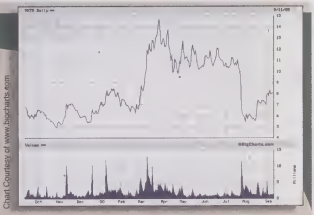
Primary products: CrystalMax drive series; DiamondMax hard disk drives, MaxAttach network storage devices, MaxBlast software

Phone number: (408) 432-1700

Street address: 510 Cottonwood Drive, Milpitas, Calif. 95035

Web address: http://www.maxtor.com

Competitors: Quantum HDD, Seagate, Western Digital, EMC



Exchange	Nasdaq	**Market Capitalization**	935.2
Trading Symbol	MXTR	**Shares Outstanding**	113.4
Fiscal Year-End	December	**Earnings Per Share**	$.02

Year-End Revenues $2,486.1 (1999)

Micron Electronics

Business description: Manufactures personal computer products and Internet services

Date founded: 1995

CEO/President: Joel Kocher

Number of employees: 2,600

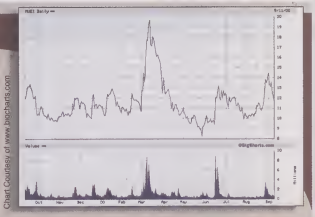
Primary Products: Millenia PCs, NetFRAME servers, Client Pro information management software

Phone number: (888) 208-1937, (208) 898-3434

Street Address: 900 E. Karcher Road, Nampa, Idaho 83687

Web Address: http://www.micronpc.com

Competitors: Apple, Compaq, Dell, Gateway, Hewlett Packard, IBM



Exchange	Nasdaq	**Market Capitalization**	1,300.0
Trading Symbol	MUEI	**Shares Outstanding**	96.6
Fiscal Year-End	August	**Earnings Per Share**	$.33

Year-End Revenues $1,437.8 (1999)

Microsoft

Business description: World's largest software manufacturer; also manufactures mice, keyboards and gaming devices; publishes Web sites and Internet services

Date founded: 1975

CEO: Steven A. Ballmer

Number of employees: 39,170

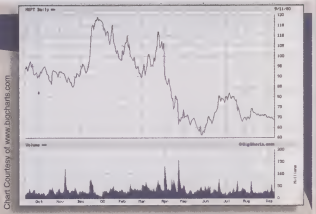
Primary Products: Office software suite, Windows operating systems, Internet Explorer browser, MSN and other Web sites, developer tools, and various applications and utilities

Phone Number: (800) 426-9400, (425) 882-8080

Street Address: One Microsoft Way, Redmond, Wash. 98052

Web Address: http://www.microsoft.com

Competitors: AOL, Corel, IBM, Intuit, Oracle, Palm, Sun Microsystems



Exchange	Nasdaq	**Market Capitalization**	373,000.0
Trading Symbol	MSFT	**Shares Outstanding**	5,262.4
Fiscal Year-End	June	**Earnings Per Share**	$1.70

Year-End Revenues $22,960.0

Motorola

Business description: Manufactures telecommunications and networking products, semiconductors and other computer components, and automobile electronics

Date founded: 1928

CEO/Chairman: Christopher B. Galvin

Number of employees: 121,000

Primary products: Pagers, mobile phones, two-way radios, integrated circuits, broadband services

Phone number: (800) 262-8509, (847) 576-5000

Street address: 1303 E. Algonquin Rd., Schaumburg, Ill. 60196

Web address: http://www.mot.com

Competitors: Ericsson, Intel, Lucent, National Semiconductor, Nokia, Texas Instruments

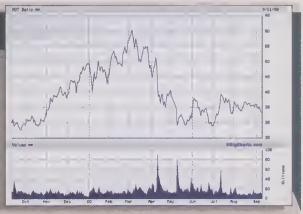


Chart Courtesy of www.bigcharts.com

Exchange	NYSE	**Market Capitalization**	77,000.0
Trading Symbol	MOT	**Shares Outstanding**	2,180.6
Fiscal Year-End	December	**Earnings Per Share**	$.63

Year-End Revenues $30,931 (1999)

National Semiconductor

Business description: Manufactures integrated circuits for the communications and networking markets, also supplies products to aerospace/defense industries

Date founded: 1959

CEO: Brian L. Halla

Number of employees: 11,600

Primary products: Display circuits, temperature sensors, amplifiers, microprocessors, embedded circuits for wireless devices,

Phone numbers: (408) 721-5000

Street address: 2900 Semiconductor Drive, Santa Clara, Calif. 95052

Web address: http://www.national.com

Competitors: Intel, Motorola, Philips Electronics, STMicroelectronics, Texas Instruments

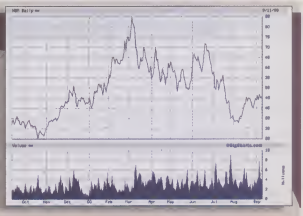


Chart Courtesy of www.bigcharts.com

Exchange	NYSE	**Market Capitalization**	8,200.0
Trading Symbol	NSM	**Shares Outstanding**	176.5
Fiscal Year-End	May	**Earnings Per Share**	$3.27

Year-End Revenues $2,139.9

NEC

Business description: Huge Japanese manufacturer of communications products, produces wide range of computing products and services

Date founded: 1899

CEO: Koji Nishigaki

Number of employees: 157,800

Primary products: fiber optics, pagers, personal computers, servers, mainframes, peripherals

Phone number: (972) 751-7000

Street address: 1525 W. Walnut Hill Lane, Irving, Texas 75038 (U.S. division)

Web address: http://www.nec-global.com

Competitors: Fujitsu, Intel, IBM, Compaq, Dell, Sun Microsystems

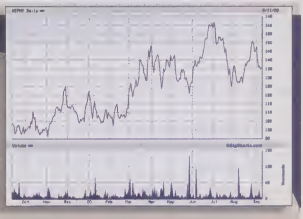


Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	44,000.0
Trading Symbol	NIPNY	**Shares Outstanding**	325.6
Fiscal Year-End	March	**Earnings Per Share**	-$4.11

Year-End Revenues $40,334 (1999)

Network Associates

Business description: Network security and management software publisher

Date founded: 1989

CEO: William L. Larson

Number of employees: 2,800

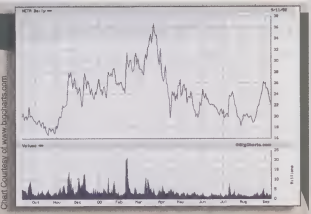
Primary products: McAfee anti-virus, PGP (Pretty Good Protection) encryption, Magic Help Desk

Phone number: (800) 338-8754, (972) 308-9960

Street address: 3965 Freedom Circle, Santa Clara, Calif. 95054

Web address: http://www.networkassociates.com

Competitors: Check Point Software, Computer Associates, InfoExpress, Network Ice, Symantec, Trend Micro



Exchange	Nasdaq	**Market Capitalization**	3,400.0
Trading Symbol	NETA	**Shares Outstanding**	138.7
Fiscal Year-End	December	**Earnings Per Share**	$.35

Year-End Revenues $683.7

Nokia

Business description: manufactures telecommunications devices and network products

Date founded: 1865

CEO/Chairman of the Board: Jorma Ollila

Number of employees: 51,177

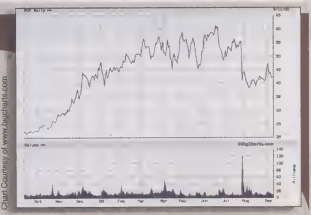
Primary products: Wireless LAN products, mobile phones, WAP services for mobile business

Phone numbers: (972) 894-4880

Street address: 6000 Connection, Drive, Irving, Texas 75039

Web address: http://www.nokia.com

Competitors: Alcatel, Cisco Systems, Ericsson, Lucent Technologies, Motorola, Pardyne Networks



Exchange	NYSE	**Market Capitalization**	215,100.0
Trading Symbol	NOK	**Shares Outstanding**	4,847.5
Fiscal Year-End	December	**Earnings Per Share**	$2.18

Year-End Revenues $19,954 (1999)

Nortel Networks

Business description: Provides telephony, wireless, networking products and services

Date founded: 1880

CEO: John A. Roth

Number of employees: 76,700

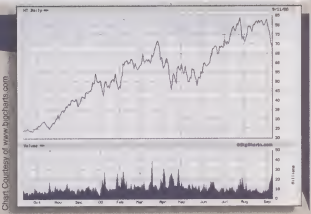
Primary products: video and cable services, network access products, routers, and optical network devices

Phone number: (800) 466-7835, (905) 863-0000

Street address: 8200 Dixie Road, Suite 100, Brampton, Ontario, L6T, 5P6, Canada

Web address: http://www.nortelnetworks.com

Competitors: Alcatel, Cisco Systems, Intel, Lucent Technologies



Exchange	NYSE	**Market Capitalization**	231,400.0
Trading Symbol	NT	**Shares Outstanding**	2,976.4
Fiscal Year-End	December	**Earnings Per Share**	-$.43

Year-End Revenues $22,217 (1999)

Novell

Business description: Publishes network software products

Date founded: 1983

CEO: Eric Schmidt

Number of employees: 5,629

Primary products: NetWare, Net Publisher, FireWALL For NT

Phone numbers: (800) 453-1267, (801) 861-7000

Street address: 122 E. 1700 South, Provo, Utah 84606

Web address: http://www.novell.com

Competitors: Cisco Systems, IBM, Microsoft, Unix, Linux

Exchange	Nasdaq	**Market Capitalization**	3,700.0
Trading Symbol	NOVL	**Shares Outstanding**	329.4
Fiscal Year-End	October	**Earnings Per Share**	$.58

Year-End Revenues $1,272.8 (1999)

NVIDIA

Business description: Makes integrated circuits and processors for the 3-D graphics market

Date founded: 1993

CEO: Jen-Hsun Huang

Number of employees: 392

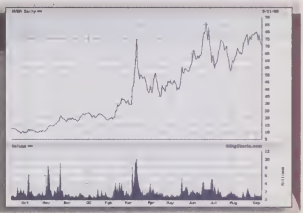
Primary products: Quadro2 Pro, GeForce2 GTS, GeForce2 MX, GeForce2 Ultra, TNT2 Pro

Phone number: (408) 615-2500

Street address: 3535 Monroe St., Santa Clara, Calif. 95051

Web address: http://www.nvidia.com

Competitors: 3dfx, 3DLabs, ATI Technologies, Matrox Graphics, SGI



Exchange	Nasdaq	**Market Capitalization**	4,900.0
Trading Symbol	NVDA	**Shares Outstanding**	64.4
Fiscal Year-End	January	**Earnings Per Share**	$.68

Year-End Revenues $374.5

Oracle

Business description: Information management software publisher and market consulter

Date founded: 1977

CEO: Lawrence J. Ellison

Number of employees: 43,800

Primary products: Oracle 8i database software, WebDB, JDeveloper

Phone numbers: (800) 672-2531, (650) 506-7000

Street address: 500 Oracle Parkway, Redwood Shores, Calif. 94065

Web address: http://www.oracle.com

Competitors: Commerce One, IBM, Microsoft, SAP, Sybase

Exchange	Nasdaq	**Market Capitalization**	258,800.0
Trading Symbol	ORCL	**Shares Outstanding**	2,836.4
Fiscal Year-End	May	**Earnings Per Share**	$2.10

Year-End Revenues $10,130

PeopleSoft

Business description: Publishes e-business software for corporations

Date founded: 1987

CEO: Craig A. Conway

Number of employees: 6,929

Primary products: PeopleSoft8, eStore, MarketPlace

Phone number: (800) 380-7638, (925) 894-3000

Street address: 4460 Hacienda Drive, Pleasanton, Calif. 94588

Web address: http://www.peoplesoft.com

Competitors: American Software, BSQUARE, Citrix Systems, J.D. Edwards, Oracle, SAP

Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	9,500.0
Trading Symbol	PSFT	**Shares Outstanding**	276.0
Fiscal Year-End	December	**Earnings Per Share**	$.11

Year-End Revenues $1,429.1 (1999)

Polaroid

Business description: Manufactures traditional and instant imaging products, supplies, and accessories

Date founded: 1937

CEO: Gary T. DiCamillo

Number of employees: 8,784

Primary products: digital cameras, instant cameras, scanners, polarizing monitor filters

Phone number: (781) 386-2000

Street address: 784 Memorial Drive, Cambridge, Mass. 02139

Web address: http://www.polaroid.com

Competitors: Canon, Eastman Kodak, Fuji Photo, Hewlett-Packard, PhotoWorks

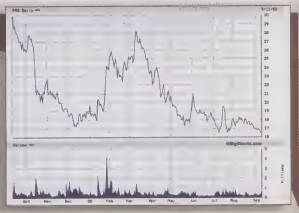


Chart Courtesy of www.bigcharts.com

Exchange	NYSE	**Market Capitalization**	759.2
Trading Symbol	PRD	**Shares Outstanding**	44.9
Fiscal Year-End	December	**Earnings Per Share**	$1.12

Year-End Revenues $1,978.6 (1999)

Priceline.com

Business description: A consumer-based online pricing system

Date founded: 1997

CEO: Daniel H. Schulman

Number of employees: 373

Primary products: auction services, PricelineMortgage, Perfect YardSale

Phone number: (203) 299-8000

Street address: 800 Connecticut Ave., Norwalk, Conn. 06854

Web address: http://www.priceline.com

Competitors: Autobytel.com, Cheap Tickets, Expedia, iVillage, Mortgage.com

Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	4,300.0
Trading Symbol	PCLN	**Shares Outstanding**	170.9
Fiscal Year-End	December	**Earnings Per Share**	-$7.76

Year-End Revenues $482.4 (1999)

PSINet

Business description: Internet communications services for businesses

Date founded: 1989

CEO: William L. Schrader

Number of employees: 4,150

Primary products: Internet access and security, Web-hosting, e-mail live audio and video, and e-commerce products and services

Phone number: (703) 726-4100

Street address: 44983 Knoll Square, Ashburn, Va. 20147

Web address: http://www.psi.com

Competitors: Cisco Systems, Concentric Network, Globix, VocalTec, Worldcom

Exchange	Nasdaq	**Market Capitalization**	3,200.0
Trading Symbol	PSIX	**Shares Outstanding**	188.7
Fiscal Year-End	December	**Earnings Per Share**	-$5.10

Year-End Revenues $554.7

Qualcomm

Business description: Maker of digital wireless communications products and services

Date founded: 1985

CEO: Irwin M. Jacobs

Number of employees: 9,700

Primary products: Globalstar mobile phones, Eudora e-mail software, OmniExpress, WAN products and services

Phone number: (858) 587-1121

Street address: 5775 Morehouse Drive, San Diego, Calif. 92121

Web address: http://www.qualcomm.com

Competitors: Ericsson, Mitel, Motorola, Netscape, Nokia

Exchange	Nasdaq	**Market Capitalization**	45,600.0
Trading Symbol	QCOM	**Shares Outstanding**	745.1
Fiscal Year-End	September	**Earnings Per Share**	$1.80

Year-End Revenues $3,937.3

Quantum DLT & Storage Systems Group

Business description: Manufactures computer hard disk drives and other storage products

Date founded: 1980

CEO: Michael A. Brown

Number of employees: 2,300

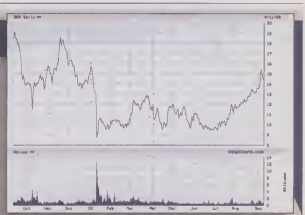
Primary products: Snap! Servers, ATL enterprise storage products, DLT 8000 tape drive

Phone number: (408) 894-4000

Street address: 500 McCarthy Blvd., Milpitas, Calif. 95035

Web address: http://www.quantum.com

Competitors: Exabyte, Iomega, Maxtor, Seagate, StorageTek, Western Digital



Exchange	NYSE	**Market Capitalization**	2,200.0
Trading Symbol	DSS	**Shares Outstanding**	147.3
Fiscal Year-End	March	**Earnings Per Share**	$.84

Year-End Revenues $1,418.9

Quantum Hard Disk Drive Group

Business description: Manufacturer of tape drives for storage and server backups

Date founded: 1980

CEO: Michael A. Brown

Number of employees: 3,200

Primary products: Atlas and Fireball tape drives

Phone number: (408) 894-4000

Street address: 500 McCarthy Blvd., Milpitas, Calif. 95035

Web address: http://www.quantum.com

Competitors: Exabyte, IBM, Maxtor, Seagate, Western Digital

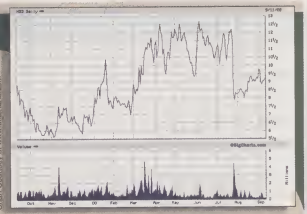


Chart Courtesy of www.bigcharts.com

Exchange	NYSE	**Market Capitalization**	721.0
Trading Symbol	HDD	**Shares Outstanding**	81.2
Fiscal Year-End	March	**Earnings Per Share**	-$.55

Year-End Revenues $3,311.6

Qwest

Business description: Provides broadband internet-based communications products and services

Date founded: 1997

CEO: Philip F. Anschutz

Number of employees: 10,000

Primary products: Dial-up Internet access, Web hosting, audio-conferencing, e-commerce consultation

Phone number: (303) 992-1400

Street address: 1801 California St., Denver, Colo. 80202

Web address: http://www.qwest.com

Competitors: AT&T, McLeodUSA, Sprint, WorldCom, Williams Communications Group

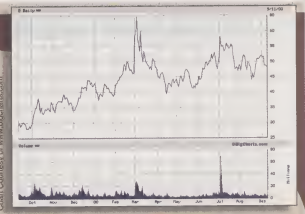


Chart Courtesy of www.bigcharts.com

Exchange	NYSE	**Market Capitalization**	85,500.0
Trading Symbol	Q	**Shares Outstanding**	1,632.5
Fiscal Year-End	December	**Earnings Per Share**	$.60

Year-End Revenues $3,927.6 (1999)

RealNetworks

Business description: Develops and publishes software that delivers media content across the Internet

Date founded: 1995

CEO/Chairman: Rob Glaser

Number of employees: 648

Primary products: RealJukebox, RealPlayer, RealProducer, RealSlideshow, RealVideo

Phone numbers: (888) 768-3248, (206) 674-2700

Street address: 2601 Elliott Ave., Seattle, Wash. 98121

Web address: http://www.realnetworks.com

Competitors: Apple Computer, Microsoft

Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	7,600.0
Trading Symbol	RNWK	**Shares Outstanding**	155.2
Fiscal Year-End	December	**Earnings Per Share**	-$.24

Year-End Revenues $131.2 (1999)

Red Hat

Business description: Provides open-source Internet software, technical support, and services

Date founded: 1994

CEO: Matthew J. Szulik

Number of employees: 435

Primary products: Linux operating system, eCos operating system, Cygnus Code Fusion, RedHat CCVS

Phone number: (919) 547-0012

Street address: 2600 Meridian Parkway, Durham, N.C. 27713

Web address: http://www.redhat.com

Competitors: Caldera Systems, IBM, Microsoft, SuSE, VA Linux

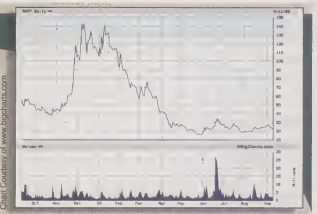


Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	3,900.0
Trading Symbol	RHAT	**Shares Outstanding**	156.4
Fiscal Year-End	February	**Earnings Per Share**	-$.42

Year-End Revenues $42.4

Royal Philips Electronics

Business description: Manufactures consumer electronics, computer components, semiconductors

Date founded: 1891

CFO: Jan H.M. Hommen

Number of employees: 232,433

Primary products: monitors, PC cameras, speakers, office equipment, lighting, DVDs

Phone number: (Philips Electronics North America) (212) 536-0500

Street address: (Philips Electronics North America) 1251 Ave. Of The Americas, New York, N.Y. 10020

Web address: http://www.philips.com

Competitors: Eastman Kodak, Creative, Hitachi, Matsushita, Sony

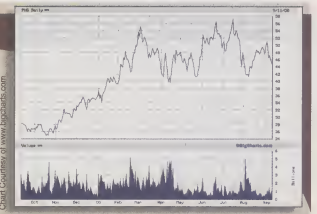


Chart Courtesy of www.bigcharts.com

Exchange	NYSE	**Market Capitalization**	58,100.0
Trading Symbol	PHG	**Shares Outstanding**	1,237.5
Fiscal Year-End	December	**Earnings Per Share**	$1.47

Year-End Revenues $31,748

RSA Security

Business description: Provides security products, services, and technology for e-business applications

Date founded: 1982

CEO: Arthur W. Coviello Jr.

Number of employees: 834

Primary products: RSA SecurID, RSA Keon public key management, RSA BSAFE encryption

Phone number: (800) 732-8743, (781) 687-7000

Street address: 36 Crosby Drive, Bedford, Mass. 01730

Web address: http://www.rsasecurity.com

Competitors: Check Point Software, Digimarc, Network Associates, Secure Computing

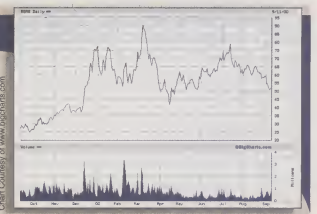


Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	2,100.0
Trading Symbol	RSAS	**Shares Outstanding**	40.1
Fiscal Year-End	December	**Earnings Per Share**	$3.77

Year-End Revenues $218.1 (1999)

S3

Business description: Designs and manufactures digital media and home networking products

Date founded: 1989

CEO: Kenneth F. Potashner

Number of employees: 1,029

Primary products: Diamond Multimedia sound cards, graphics cards, and modems; Rio digital audio devices

Phone number: (408) 588-8000

Street address: 2841 Mission College Blvd., Santa Clara, Calif. 95054

Web address: http://www.s3.com

Competitors: Cisco Systems, Creative Technology, Elsa, Intel, Sony, Voyetra Turtle Beach

Exchange	Nasdaq	**Market Capitalization**	1,800.0
Trading Symbol	SIII	**Shares Outstanding**	91.3
Fiscal Year-End	December	**Earnings Per Share**	4.27

Year-End Revenues $352.6 (1999)

SAP

Business description: Enterprise software publisher

Date founded: 1972

CEO: Henning Kagermann

Number of employees: 21,699

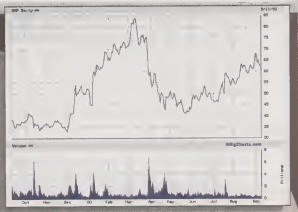
Primary products: mySAP.com, marketplace hosting services, e-commerce applications

Phone number: (888) 596-1727, (610) 661-1000

Street address: 3999 West Chester Pike, Newtown Square, Pa. 19073

Web address: http://www.sap.com

Competitors: Baan, J.D. Edwards, Oracle, PeopleSoft, Siebel



Exchange	NYSE	**Market Capitalization**	11,400.0
Trading Symbol	SAP	**Shares Outstanding**	174.3
Fiscal Year-End	December	**Earnings Per Share**	$3.47

Year-End Revenues $5,146 (1999)

Seagate Technology

Business description: Manufacturer storage products for PCs, workstations, and network servers

Date founded: 1979

CEO: Stephen J Luczo

Number of employees: 82,000

Primary products: Disk and tape drives, data management and e-commerce software

Phone numbers: (800) 732-4283, (831) 438-6550

Street address: 920 Disc Drive, Scotts Valley, Calif. 95067

Web address: http://www.seagate.com

Competitors: Exabyte, Hewlett-Packard, IBM, Iomega, Quantum, Western Digital

Exchange	NYSE	**Market Capitalization**	13,400.0
Trading Symbol	SEG	**Shares Outstanding**	227.2
Fiscal Year-End	June	**Earnings Per Share**	$1.34

Year-End Revenues $1,176

SGI

Business description: Consultant and manufacturer of computing and advanced graphics products

Date founded: 1982

CEO/Chairman: Robert R. Bishop

Number of employees: 9,191

Primary products: Origin 3000 system, SGI Servers, flat-panel displays, high-end storage and security software

Phone numbers: (650) 960-1980

Street address: 1600 Amphitheatre Parkway, Mountain View, Calif. 94043

Web address: http://www.sgi.com

Competitors: Compaq, Hewlett-Packard, Hitachi, IBM, Sun Microsystems

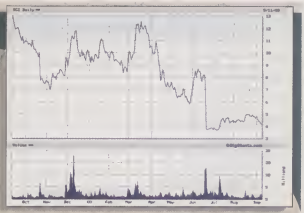


Chart Courtesy of www.bigcharts.com

Exchange	NYSE	**Market Capitalization**	843.2
Trading Symbol	SGI	**Shares Outstanding**	184.8
Fiscal Year-End	June	**Earnings Per Share**	-$4.52
		Year-End Revenues	$2,331.1

Siebel Systems

Business description: E-business application publisher

Date founded: 1993

CEO: Thomas M. Siebel

Number of employees: 3,203

Primary products: eBusiness 2000, eMarketing, eFinance, call center and sales software

Phone number: (800) 647-4300, (650) 295-5000

Street address: 1855 S. Grant St., San Mateo, Calif. 94402

Web address: http://www.siebel.com

Competitors: Baan, Clarify, Oracle, PeopleSoft, SAP

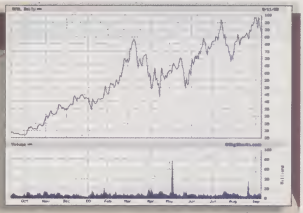


Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	40,400.0
Trading Symbol	SEBL	**Shares Outstanding**	199.6
Fiscal Year-End	December	**Earnings Per Share**	$.46
		Year-End Revenues	$790.9 (1999)

Sony

Business description: Manufactures entertainment and computer electronics products

Date founded: 1946

CEO: Nobuyuki Idei

Number of employees: 189,700

Primary products: Consumer electronics, notebooks and PCs, semiconductors, PlayStation, and PlayStation2

Phone numbers: (Sony Corp. Of America) (800) 222-7669, (212) 833-6849

Street address: (Sony Corp. Of America) 550 Madison Ave., 9th Floor, New York, N.Y. 10022

Web address: http://www.world.sony.com

Competitors: Hewlett-Packard, IBM, Matsushita, Nintendo, Philips Electronics, Sega, Time Warner

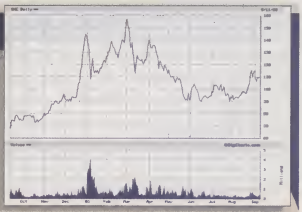


Chart Courtesy of www.bigcharts.com

Exchange	NYSE	**Market Capitalization**	97,600.0
Trading Symbol	SNE	**Shares Outstanding**	900.8
Fiscal Year-End	March	**Earnings Per Share**	$.26
		Year-End Revenues	$63,082

Sprint

Business description: Telecommunications services provider

Date founded: 1899

CEO: William T. Esrey

Number of employees: 77,600

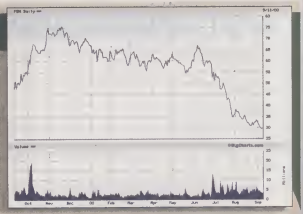
Primary products: Local, long-distance, wireless services, broadband internet, and telecommuications products

Phone number: (913) 624-3000

Street address: 2300 Shawnee Mission Parkway, Westwood, Kan. 66205

Web address: http://www.sprint.com

Competitors: AT&T, Verizon, WorldCom, Alltel, Southwestern Bell



Exchange	NYSE	**Market Capitalization**	24,400.0
Trading Symbol	FON	**Shares Outstanding**	798.4
Fiscal Year-End	December	**Earnings Per Share**	$1.87

Year-End Revenues $17,016 (1999)

STMicroelectronics

Business description: Makes semiconductors for telecommunications products, computers, and electronic devices

Date founded: 1987

CEO: Pasquale Pistorio

Number of employees: 35,000

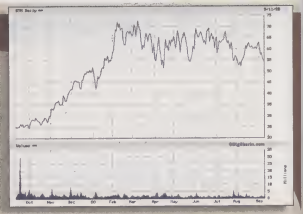
Primary products: Circuits and chips for speech devices, ADSL, video decorders, and modems

Phone number: (U.S. headquarters) (972) 466-6000

Street address: (U.S. headquarters) 1310 Electronics Drive, Carrollton, Texas 75006

Web address: http://www.st.com

Competitors: Infineon Technologies, Intel, NEC, Cirrus



Exchange	NYSE	**Market Capitalization**	48,900.0
Trading Symbol	STM	**Shares Outstanding**	852.8
Fiscal Year-End	December	**Earnings Per Share**	$.99

Year-End Revenues $5,056 (1999)

Sun Microsystems

Business description: Manufacturer of and service provider for networking hardware and software

Date founded: 1982

CEO/Chairman: Scott McNealy

Number of employees: 29,000

Primary products: StorEdge and Java software, Enterprise servers, UltraSparc workstations, processors, storage software

Phone numbers: (800) 801-7869, (650) 960-1300

Street address: 901 San Antonio Road, Palo Alto, Calif. 94303

Web address: http://www.sun.com

Competitors: Compaq, IBM, Microsoft, Dell, Hewlett-Packard

Exchange	Nasdaq	**Market Capitalization**	194,600.0
Trading Symbol	SUNW	**Shares Outstanding**	1,586.4
Fiscal Year-End	June	**Earnings Per Share**	$1.10

Year-End Revenues $15,721

Symantec

Business description: Internet security and utility software publisher

Date founded: 1982

CEO/Chairman: John Thompson

Number of employees: 2,600

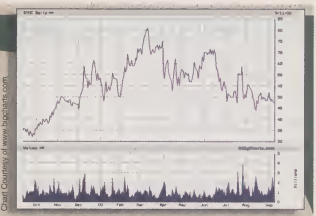
Primary products: Norton AntiVirus, Norton Utilities, Norton SystemWorks, WinFax Pro, Norton Ghost

Phone numbers: (408) 253-9600

Street address: 10201 Torre Ave., Cupertino, Calif. 95014

Web address: http://www.symantec.com

Competitors: Computer Associates, Microsft, Network Associates, RSA Security,



Exchange	Nasdaq	**Market Capitalization**	3,000.0
Trading Symbol	SYMC	**Shares Outstanding**	59.6
Fiscal Year-End	March	**Earnings Per Share**	$2.84

Year-End Revenues $745.7

Texas Instruments

Business description: Manufactures digital signal processors, analog chips, and electronic devices

Date founded: 1930

CEO: Thomas J. Engibous

Number of employees: 38,000

Primary products: Broadband and wireless devices, storage products, calculators, microcontrollers, DSPs and other processors

Phone numbers: (800) 336-5236, (972) 995-2011

Street address: 12500 TI Blvd., Dallas, Texas 75236

Web address: http://www.ti.com

Competitors: Analog Devices, Lucent, Motorola, Nokia, STMicroelectronics

Exchange	NYSE	**Market Capitalization**	107,500.0
Trading Symbol	TXN	**Shares Outstanding**	1,640.5
Fiscal Year-End	December	**Earnings Per Share**	$1.49

Year-End Revenues $9,468 (1999)

VERITAS Software

Business description: Publisher of enterprise storage management applications

Date founded: 1982

CEO: Mark Leslie

Number of employees: 945

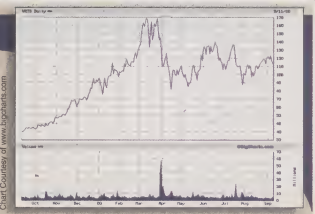
Primary products: Storage area network, file and storage management softare, and backup products

Phone number: (650) 335-8000

Street address: 1600 Plymouth St., Mountain View, Calif. 94043

Web address: http://www.veritas.com

Competitors: Computer Associates, Legato Systems, Previo, Storage Tek



Exchange	Nasdaq	**Market Capitalization**	48,200.0
Trading Symbol	VRTS	**Shares Outstanding**	398.7
Fiscal Year-End	December	**Earnings Per Share**	-$1.85

Year-End Revenues $596.1 (1999)

Verizon Communications

Business description: Telecommunications services provider

Date founded: 2000

Co-CEOs: Charles R. Lee and Ivan G. Seidenberg

Number of employees: 145,000

Primary products: Local, long-distance, wireless, and paging services

Phone number: (800) 621-9900, (212) 395-2121

Street address: 1095 Ave. of the Americas, New York, N.Y. 10036

Web address: http://www.verizon.com

Competitors: AT&T, SBC Communications, Sprint, WorldCom

Chart Courtesy of www.bigcharts.com

Exchange	NYSE	**Market Capitalization**	116,300.0
Trading Symbol	VZ	**Shares Outstanding**	2,720.2
Fiscal Year-End	December	**Earnings Per Share**	$3.56

Year-End Revenues $33,174 (1999)

Western Digital

Business description: Manufacturer of data storage products computers and set-top boxes

Date founded: 1970

CEO: Matthew H. Massengill

Number of employees: 10,390

Primary products: Internal and external hard drives, storage devices, and accessories

Phone number: (949) 932-5000

Street address: 8105 Irvine Center Drive, Irvine, Calif. 92618

Web address: http://www.westerndigital.com

Competitors: IBM, Quantum, Seagate, TEAC

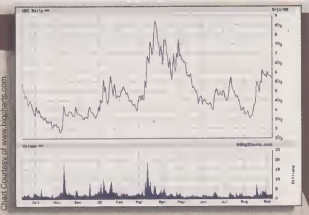


Chart Courtesy of www.bigcharts.com

Exchange	NYSE	**Market Capitalization**	834.8
Trading Symbol	WDC	**Shares Outstanding**	139.4
Fiscal Year-End	June	**Earnings Per Share**	-$2.89

Year-End Revenues $1,957.6

WorldCom

Business description: Telecommunications services provider

Date founded: 1983

CEO: Bernard J. Ebbers

Number of employees: 77,000

Primary products: Long-distance, Internet-data, wireless services, and facilities-based local service

Phone number: (877) 624-9266, (601) 460-5600

Street address: 500 Clinton Center Drive, Clinton, Miss. 39056

Web address: htt://www.wcom.com

Competitors: AT&T, Cable And Wireless, Sprint, Verizon

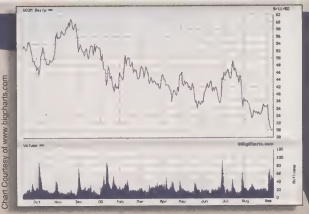


Chart Courtesy of www.bigcharts.com

Exchange	Nasdaq	**Market Capitalization**	90,200.0
Trading Symbol	WCOM	**Shares Outstanding**	2,863.1
Fiscal Year-End	December	**Earnings Per Share**	$1.69

Year-End Revenues $37,120 (1999)

Xerox Corporation

Business description: Manufactures hardware and software for the digital imaging market

Date founded: 1906

CEO: Paul A. Allaire

Number of employees: 94,600

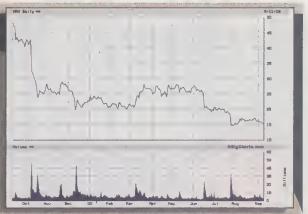
Primary products: Printers, photocopiers, MFDs (multifunction devices), and imaging software

Phone numbers: (800) 275-9376, (203) 968-3000

Street address: 800 Long Ridge Road, Stamford, Conn. 06904

Web address: http://www.xerox.com

Competitors: Canon, Hewlett-Packard, Ricoh



Exchange	NYSE	**Market Capitalization**	10,600.0
Trading Symbol	XRX	**Shares Outstanding**	666.3
Fiscal Year-End	December	**Earnings Per Share**	$.70

Year-End Revenues $19,228 (1999)

Xircom

Business description: Manufactures mobile network access hardware and accessories

Date founded: 1988

CEO: Dirk I. Gates

Number of employees: 1,000

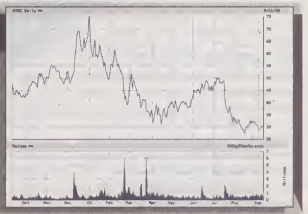
Primary products: USB (Universal Serial Bus) port expansion devices, access cards, conference room networking products

Phone number: (805) 376-9300

Street address: 2300 Corporate Center Drive, Thousand Oaks, Calif. 91320

Web address: http://www.xircom.com

Competitors: 3Com, Fujitsu, IBM, Synchrotec



Exchange	Nasdaq	**Market Capitalization**	873.4
Trading Symbol	XIRC	**Shares Outstanding**	$29.8
Fiscal Year-End	September	**Earnings Per Share**	$1.14

Year-End Revenues $408.9 (1999)

Yahoo!

Business description: Internet commerce, communications, and media provider

Date founded: 1994

CEO: Timothy Koogle

Number of employees: 1,992

Primary products: Yahoo! portal, auctions, shopping, e-mail services, WAP-compatible information services, Wallet

Phone number: (408) 731-3300

Street address: 3420 Central Expressway, Santa Clara, Calif. 95051

Web address: http://www.yahoo.com

Competitors: Alta Vista, American Online, Excite, Go Network, Lycos, MSN (Microsoft Network)

Exchange	NYSE	**Market Capitalization**	61,600.0
Trading Symbol	YHOO	**Shares Outstanding**	549.3
Fiscal Year-End	December	**Earnings Per Share**	$.23

Year-End Revenues $588.6 (1999)

ASP (Application Service Provider)—An Internet company that manages and maintains software applications. Instead of purchasing a software license, businesses pay a fee to the ASP to use these applications as needed over the Internet. Because businesses don't have to buy multiple software licenses or servers and don't have to pay IT professionals to troubleshoot problems, using an ASP can save quite a bit of money. When a software upgrade is necessary, the ASP handles it and business clients don't have to purchase and install new software.

accelerator—Accelerators are companies that, like Internet incubators, provide capital, office space, materials, management advice, and even personnel for Internet startups. The services are similar, but as their name implies, accelerators strive to significantly decrease the amount of time it takes the company to develop. A company that chooses an accelerator as opposed to an incubator will have to work harder to develop its product and grow its business, but making an early entrance into the market with a new product or idea can be an important advantage. Accelerators are classified as B2B companies.

B2B (business-to-business)—B2B companies include any Internet business that sells goods or services to other businesses. A B2B site may be a company that uses the Internet to bring together auto parts distributors with auto parts retailers, for instance. Internet incubators, which offer capital, equipment, personnel, and advice to young Internet companies, may also be considered B2B ventures. ASPs, or application service providers, sell software services over the Internet to businesses and fall within the B2B category, as well. B2B companies managed to steal the spotlight from B2C companies for a short time this year, but investors have since cooled on the B2B segment.

B2C (business-to-consumer)—B2C seized the attention of investors in 1999. These sites, which sell goods and services to consumers over the Internet, grew rapidly and quickly caught the attention of Wall Street. Despite increasing revenues, however, many B2C companies have yet to make a profit, instead accruing more financial losses as they struggle to compete in a crowded market place. Many B2C companies have faced plummeting stock prices in 2000. Marketing and development are essential expenses for B2C companies which hope to survive in this fiercely competitive sector. Amazon.com, Buy.com, and PlanetRx.com are among the better known B2C companies.

B2E (business-to-employee)—A method of "marketing" used especially by high tech companies to retain their employees. B2E may include additional benefits, stock options, or pay bonuses to encourage current employees to stay with the company. Companies in Silicon Valley are using B2E strategies in an attempt to reduce turnover at a time when it is common for employees to jump from one dot-com company to another.

click-and-mortar alliances—When an established retail business forms an alliance with an online retailer, a click-and-mortar alliance is born. These alliances are generally favorable to both parties: The online retailer gets real world recognition that comes from identifying your site with a brand name. The retailer gets its foot in the online retail world and can supplement traditional retail sales with online sales. A major click-and-mortar alliance, is the recent alliance between Toys 'R' Us and Amazon.

co-opetition—Co-opetition is idea that companies can benefit from cooperating to expand the market even while they compete to divide it up. This is happening in the palm-sized computer market as licensees of the Palm OS cooperate with Palm to grow the market for palm-sized computers. This may drive Palm's percentage of the hardware market down, but it increases the total market for palm-sized computers. Co-opetition is the market application of the principle that it's better to have 40% of $1,000 than it is to have 100% of $100. Adam Brandenburger and Barry Nalebuff advanced the term in their book "Co-Opetition." The idea originally comes from gaming theory.

co-location—Co-location services help protect a Web site's most valuable asset, its Web server. A co-location service places a Web server at a secure location with a dedicated power supply, Internet connection, and technical support. Co-location services provide some protection against natural disasters, theft, and fire by housing the hardware and equipment needed to maintain a Web site at a protected location instead of at the company's own site. This helps to ensure that customers can always reach the Web site, which is extremely important to online companies as sales lost due to a downed Web site can be devastating. Most services also provide a technical support staff to help with regular maintenance and emergency problems. Although these services do provide a high-speed connection to the Internet, they do not usually provide the server itself.

data hygiene—Data hygiene describes the degree to which information within a database is accurate. If data is consistent, complete, and accurate, it's considered clean. If data is dirty, companies have to invest a significant amount of time in going through old databases and correcting misspellings and errors in punctuation and capitalization, and filling in empty fields. Clean data is extremely important to marketing departments who may rely on data for a variety of reasons, including targeting potential customers. Traditionally, data entry personnel entered information into the database and could provide a certain amount of quality control. Web sites, however, now rely on a customer to enter his or her own information correctly, which raises the number of errors found in the database. Small companies may occasionally decide to outsource their data hygiene needs to another company.

flea-tailer—An online business which connects sellers of excess, used, or miscellaneous products with buyers. A flea-tailer can follow a B2B, B2C, or P2P model. eBay, which brings together individual buyers and sellers using an auction format, is one example of a P2P-model flea-tailer. Despite the name, the products offered for sale aren't necessarily low quality or even cheap. One B2B company, Rebound, specializes in excess products including name brand clothes, computers, and furniture and boasts an average order of $50,000.

flipping—Flipping is a method used by recruiters, primarily in high tech fields, to find potential employees for clients. By entering a company's URL into a search engine along with a keyword, such as "resume," recruiters can "flip" a site and find personal Web pages with links to the main site or pages hidden away within a company's Web site. The results typically provide recruiters with a list of potential employees who either work for a specific company (if using a company's URL) or have a specific skill. (If you flip the URL of a Java development Web site, for instance, you're likely to find Java developers.) Recruiters can then contact the individuals whose resumes they've found and attempt to place them with another company.

path to profitability—Many e-commerce retailers faced with repeated net losses, as well as startup companies, are now using the phrase "path to profitability" to describe their business plans. Companies hope the term, which describes profitability as a process and not a prerequisite for investing, will pacify investors who are becoming less willing to finance Internet companies that continue to lose money. A path to profitability outlines how and when a company will begin making a profit. A company with a shorter projected path to profitability is, for obvious reasons, more attractive to investors.

Internet incubator—An Internet incubator is a company that offers a complete range of services to young online companies in order to get them off the ground. Of course, an incubator offers financial help to startups, providing the initially needed capital and in some cases incubators offer additional rounds of financing as well. In addition to financial backing, incubators may provide office space, equipment, personnel, and even advice and guidance. Such a range of services does cost considerably in terms of equity. Incubators interested in long-term ownership of a company will often take a 30% to 70% stake in the company. Internet incubators fall under the general category of B2B businesses.

interstitial advertising—Interstitial advertisements are a new kind of online advertisement that pops up between Web pages, often while you are waiting for a Web page to download. Interstitial advertisements are animated and are typically about 10 seconds long. Online retailers hope they will prove more effective than banner ads, which have suffered dropping clickthrough rates as Internet users have become accustomed to them and learned to filter them out. Most interstitial advertisements have an exit option, but many users find them invasive and annoying nonetheless.

IPO (Initial Public Offering) Meltdown—An IPO meltdown occurs when a new dot-com or other company drops dramatically in value on the stock market on the first day it is offered to the public or shortly thereafter. Going public is often the goal of Internet startups, but IPO meltdowns have been an all too common occurrence in the past year as numerous dot-com companies went public only to see stock plummet.

P2P (Peer-to-Peer)—The newest segment of e-commerce is known as P2P, or Peer-to-Peer. P2P companies connect users with other users and allow them to swap files over the Internet. The aspect of P2P which is most important for e-commerce is personal electronic payments. PayPal is a P2P company that allows individual users to send payments to one another via e-mail. ProPay is another P2P site that allows its members to collect credit card payments. Such sites have a variety of uses, including payment for online auctions, and are useful for small businesses who want to set up shop online.

PSA (personal satellite assistant)—The name of a small, round robot being developed by NASA scientists to assist astronauts walking in space. PSAs are about the size of a softball and come with various environmental sensors, a video camera, a microphone, navigation sensors, and wireless network capabilities and connections. In the zero-gravity environment of space, these battery-powered robots move using tiny fans and can work without human intervention.

salvagers—Talented employees with "new technology" skills are hard to hold on to in today's hot economy. Demand for such workers is high, and particularly in places like Silicon Valley where many high tech companies vie for skilled labor, retaining employees is a challenge . In order to combat high turnover, as well as aggressive recruitment tactics such as flipping, many companies are hiring salvagers, people who search online Web sites looking for resumes posted by current employees. If the salvager finds a resume, he or she attempts to "salvage" the wayward employee by convincing her or him to stay with the company instead of jumping ship.

UCITA (Uniform Computer Information Transaction Act)—An act proposed to the states by the NCCUSL (National Conference of Commissioners on Uniform State Law), which would allow software manufacturers to severally limit consumer rights to sue for defective software or to criticize the product in a public forum. UCITA has been criticized for the harshness of the proposal, particularly for provisions that allow software manufacturers to disable software if they feel a customer is violating the terms of the license. RS

Make It Big In "The Industry"

A Look At The New Economy Landscape

The twenty-somethings in charge of your favorite Web sites probably don't remember Sally Struthers from her "All In The Family" days, but they do know her from her latter-day TV commercials for correspondence courses. The phrase they remember best is: "Want to make more money? Sure, we all do." For many movers and shakers in the so-called "New Economy," Sally's no-brainer catchphrase might as well have been emblazoned above the entrance of every computer science classroom from coast to coast.

Although not everyone who takes a high-technology job does so just for the money, the reality is that the computer and Internet industries comprise a very lucrative job market. There is something for everyone, whether in hands-on fields, such as chip design and programming, or on the interpersonal side of things, as in marketing and management. If you haven't been following the computer and Internet industries very closely, though, you may want to survey the landscape before trying to land a job there. We'll guide you through the workplace as it now stands.

■ **Hot Jobs.** Few industries ever grew like the computer and Internet industries are presently growing. And where there's growth, there are plenty of hot jobs available.

In an April 2000 study for the ITAA (Information Technology Association of America), Market Decisions Corporation predicted 20% of the new IT (information technology) jobs this year will relate to databases. Because one of the main attractions of the Internet is the ability to look things up, databases are in high demand. Also, no sizable business can survive without one or more databases to keep track of their customer data, especially in this age of e-commerce. Also, no sizable business can survive without one or more databases, especially in this age of e-commerce.

The ITAA study also predicted that 13% of new IT jobs will require Web skills. Even if your job title isn't "Webmaster," you may find yourself highly valued if you can provide technical insight, security analysis, or support of your company's online presence.

The U.S. Bureau of Labor Statistics' prediction of the fastest-growing jobs from 1998 to 2008 (Feb. 2000), meanwhile, says computer-engineering jobs will grow the fastest (108%), closely followed by computer-support specialists (102%). The biggest numerical increase, however, will be 577,000 new system analyst positions.

Another monster field right now is in wireless applications. Handheld computer, PDA (personal digital assistant), and cellular phone makers are falling all over themselves to come up with useful palm-sized devices that can surf modified Web pages without a cable. Europe and Asia are ahead of North America in wireless coverage, so there is plenty of work to do. "People with a strong analog or radio background and knowledge of the digital side of those arenas are in extraordinarily high demand," says Mark O'Deady, managing director and chief executive officer of Connect The Dots, a consulting company in Mountain View, Calif.

Of course, technology needs its vocal champions to translate it into something the public will buy. Marketing, public relations, and sales positions should continue to be in high demand in the computer and Internet arenas.

And just in case you're worried about missing the boat, don't be. According to Market Decisions Corporation, 53% of the 1.6 million new IT jobs this year will go unfilled. For a look at the salaries related to more IT positions, check out the illustrations that follow this article.

Just the Facts!

Homes in Silicon Valley are expensive compared to the rest of the U.S. In the spring of this year, the median price for a home in Silicon Valley was $465,400, compared to $121,600 in the metropolitan Midwest and $143,600 in Northeastern cities. (Source: National Association of Realtors)

■ **Do You Know The Way To San Jose?** If you're hitching a ride on a particular industry, you need to observe one rule of thumb: The mountain isn't going to come to you. If you want to be in pictures, go to Hollywood; if you want to inflict advertising on innocent bystanders, go to Madison Avenue; if you want to make your mark on the computer industry, go to Silicon Valley.

Silicon Valley, along with San Francisco to the northwest, is the prime destination for computer job-seekers everywhere. Intel's headquarters sits in Santa Clara, just down the road from Sunnyvale, home of rival AMD (Advanced Micro Devices). Cisco is based in San Jose, at the opposite end of the Valley from Sun Microsystems in Palo Alto. Grapes grow

Do You Know...

...who invented the computer mouse?

In 1963 Doug Engelbart was working on ways to augment the human intellect and trying to improve the way people interact with computers. While looking for an easy, efficient way to move the cursor around the screen, he came up with the idea for a small box with two wheels on the bottom to control horizontal and vertical movement. It connected to the computer by a cord that ran from its back and it reminded Engelbart and his team of a mouse. They nicknamed it accordingly and the name stuck.

in the wine country far to the north, but Apple grew in Cupertino. The Valley is also home to Stanford University and the Palo Alto Research Center.

Of course, if you do make it big in Silicon Valley and then take a plum job elsewhere, be aware that you may never be able to afford to move back. The population influx, which is fed by a hungry job market, is outpacing home-builders and driving up costs. In fact, the median single-family home price in the Bay Area in the second quarter of 2000 was $465,410, up 26% from a year ago (California Association of Realtors). Read the "Two Nanoseconds In The Valley" sidebar to "Moving At The Speed Of Cash" for more details about living in Silicon Valley.

California's Bay Area isn't the only place to be. The first alternative is Bill Gates' backyard, Seattle. Redmond, the site of Microsoft's campus, lies east of Seattle across Lake Washington while nearby Bellevue provides upscale housing for the Microsoft stockholders who can afford it. RealNetworks, Amazon.com, and tons of other Internet firms also make their homes in Seattle. Check out the "Come As You Are" sidebar to "Moving At The Speed Of Cash" for more information about the Emerald City.

Austin, Texas, is another fast-growing hub of high-tech commerce. With major facilities from such heavyweights as Motorola and AMD, the capital of the Lone Star State sets the tone for the so-called "Silicon Prairie." And, don't forget neighbors such as Dell in Round Rock, Texas Instruments in Dallas, and Compaq in Houston.

Finally, there are Internet and computer-related companies in practically every major city. Notable areas include Phoenix and Tempe, Ariz.; Armonk, Rochester, and New York, N.Y.; and northern Virginia.

Dates To Remember

On Sept. 9, 1947, computer programmer Grace Murray Hopper discovered the first computer "bug" at Harvard University. A moth had somehow gotten into the Harvard Mark II machine and caused it to malfunction. Hopper picked up the bug and glued it into her logbook.

Quick Tips

If you're having problems with the popular instant messaging software ICQ, try to rebuild your ICQ databases. To do this, close ICQ and open the ICQ Database Converter in the ICQ directory in your Start menu. Follow the on-screen instructions to fix any database errors. The process could take awhile, depending on the size of the database. ICQ does occasionally corrupt databases, but this should fix the problems and prevent frequent crashes.

■ The Value Of Experience.

Although HR (human resources) directors prize enthusiasm and a good education in their prospective recruits, one thing is clear: experience is once again king. This holds true at companies large and small. In fact, HR directors rate hands-on experience second only to knowledge in the relevant area, according to a study by Market Decisions Corporation (April 2000).

If companies need experienced people at the entry levels, they need them infinitely more up top. As more and more startups founded on youthful exuberance and run on venture capital trip and fall, entrepreneurs are realizing it might be a good idea to hire someone older than 35 to run things. Today, most venture capitalists and potential shareholders will snub any startup without battle-tested hands at the helm. "Where's the experience?" asks Chad Waite, a partner with venture capital firm Olympic Venture Partners. "We'd probably pass, unless we felt that there was real maturity in that twenty-something team."

Of course, if a company does have plenty of experienced employees, its competitors will do their best to hire them away. As the job market gets more and more cutthroat, companies use headhunters to find potential recruits and then throw in bonuses, relocation costs, and partially or fully vested stock

The Halo Effect

Call it gravity. The biggest celestial object in space, such as a star, will draw smaller bodies, planets, and moons to it. Similarly, a multibillion dollar Internet, hardware, or software firm near a major city will attract entrepreneur and techie immigrants from everywhere. Soon, you'll see an explosion of start-ups around the successful company, some of which will have real lasting power while others have nothing but a goofy compound name that no one else had registered yet.

According to a June 2000 report by IDG Research Services for The Standard, San Francisco, New York, and Los Angeles lead the way in the percentage of total startups, each with 9%. Silicon Valley follows with 6%, even though it's a slightly cheaper place to be than San Francisco. Seattle comes in later after a few other areas with 4% of the total.

Not everyone wants to found their startups in Silicon Valley because it's no longer necessary to brave its high cost of living; after all, the Internet doesn't care where a business is located. However, it's still important to be geographically near a big high-tech hub because these attract workers skilled in technology and/or business. In addition, tech-savvy consultants, public relations firms, and venture capitalists are never far away.

Nicknames for these digital hamlets sprout up almost as fast as the startups themselves. For example, east Texans live in the "Silicon Prairie" because industry giants are located in Austin, Round Rock, Houston, and Dallas. Manhattan, which is presumably located upon a remarkable outcropping of right-angled alleys, goes by "Silicon Alley." And, the analog chip industry in Phoenix, Ariz., which is home to such companies as ON Semiconductor, Microchip, and STMicroelectronics, has earned it our favorite nickname, the deliciously redundant, "Silicon Desert." ■

options to clinch the deal. Sometimes in the feeding frenzy of the dot-com world, a big fish simply buys a little fish and gets its employees all at once.

However, some factors in recruiting are beyond a company's control. In congested areas such as Silicon Valley, the morning commute may weigh in more heavily than any other consideration, at least for workers in their 30s and older. One of O'Deady's friends, who is a director of marketing communication in the area, "made her last career move based solely upon which of [the] three of four companies she was in discussions with was the easiest commute." O'Deady adds his friend had already gained some financial stability through a successful IPO (initial public offering) and was able to weigh lifestyle factors ahead of monetary ones.

Retention. On the HR and administrative side, finding and hiring good workers is only one facet of the battle. With so much opportunity in every quarter, companies are hard-pressed to hold on to their whiz kids once they have them.

Companies have used stock options as a panacea for employee retention in the hopes that workers won't jump ship until their options vest. At least, that was the case up until the spring of 2000, when many high-tech stocks tanked. A lot of those stocks recovered nicely, but the lesson resounded in job-seekers' skulls: Get cash on the barrel first before worrying about stock returns later.

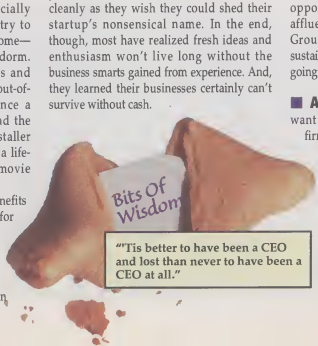
Many high-tech companies, especially newer software and Internet ones, try to make their employees feel right at home—assuming home feels like a college dorm. Game rooms with pinball machines and foosball tables, kitchenettes, and roll-out-of-bed dress codes often help convince a wunderkind that he or she has found the right "cultural fit." The office of Installer VISE developer MindVision even has a life-sized statue of the alien from the movie "Predator" in the lobby.

Other popular Internet company benefits noted in a K. Russo Associates study for NewsAlert (June 2000) were fully paid dental and medical insurance premiums, paid maternity (and paternity) leave, referral and sign-on bonuses, the option to telecommute, and even compensation for child-care costs. But high-tech employees sometimes give all that up if their jobs aren't satisfying anymore. The hard fact is that many workers need to feel they are contributing to something exciting that can change people's lives.

> **They Said It...**
>
> ***"If I could embed a locator chip in my kids, I would. Who knows where their kids are all the time?"***
>
> *-Scott McNealy, Sun Microsystems CEO, at the Consumer Electronics Show, Jan. 7, 2000.*

Make Your Own Job. If you can't find that perfect, meaningful software company job, or if you're spending more time fighting office politics and procedures than creating anything that you're proud of, you can make your own job. Although the market reception and public image of Internet startups has dimmed a bit, there is still vast opportunity out there to start your own online business.

The adolescent dream of getting in, getting rich, and getting out has evaporated somewhat, leaving a core of young Internet businessmen and women who chose to grow up in a hurry. Some will have a pot of vested stock-option gold awaiting them in a few years; others will have shed that notion as cleanly as they wish they could shed their startup's nonsensical name. In the end, though, most have realized fresh ideas and enthusiasm won't live long without the business smarts gained from experience. And, they learned their businesses certainly can't survive without cash.



"'Tis better to have been a CEO and lost than never to have been a CEO at all."

Despite public perceptions to the contrary, only 25% of new businesses are partly funded by venture capital (IDG Research Services for The Standard, June 2000). Others have some sort of benefactor or angel investor. Only a relative few **bootstrap** their companies, which means trying to grow them using only their own funds and profits. Not only is bootstrapping difficult but it also may keep the company from executing a hot idea before the competition.

"Development and market windows are shrinking so fast that a company just absolutely cannot afford to be 'late-to-market' and expect to survive, nonetheless flourish," says venture capitalist Waite. He added that unless the entrepreneur has "phenomenal personal wealth," bootstrapping can only take a company so far.

If you do hope to grow a startup and attract a good venture capital investment while you're at it, you and your staff need a few things first. Waite says he looks for "tremendous" talent and motivation, a focus in a rapidly growing market, the ability to lead or define that market, and a vision for the future. Finally, be sure to have an exit strategy, whether it's to take the company public in an IPO or to sell off the company for a profit.

No matter what inevitable setbacks you encounter or how many times you may be forced to change your business plan, don't lose heart because the New Economy is just beginning. "There's still a big broad range of opportunities," says Bill White, head of affluent marketing consulting at Spectrem Group. "The deeper drive behind this is sustainable, which is why we think that this is going to continue to be a very strong market."

A Breed Apart. Some people don't want to just work for a thriving high-tech firm; they want to run it. Having "CEO" next to your name on a business card isn't as exclusive as it used to be, thanks to the equalizing influence of the Internet. Still, it's the brass ring for ladder-climbers in the business world, and it carries the pay, perks, and prestige to show it. In fact, New York consultants Towers Perrin says that in 1999, CEOs in the United States made 34 times the wages of manufacturing

employees ("1999 Worldwide Total Remuneration;" http://www.towers.com).

If it seems to you CEOs get a lot of money to provide some sort of vague leadership, you're not alone. However, they get to make the decisions that will determine if the company has a boom or a bust. Their choices can affect as few as two or three people in a tiny dot-com or more than 300,000 in the case of IBM. Whichever the case, the CEO has to energize the workforce and keep the stockholders, investors, and perhaps even the landlord happy.

CEO lifespan. The androids in the sci-fi classic "Blade Runner" were virtual superbeings with one Achilles' heel: a four-year lifespan. Oddly, this also seems to be the case with high-profile CEOs. Not that they keel over after a few years on the job, mind you, but they do seem to come and go with some regularity.

Every business is vulnerable to thousands of variables, from liability issues to a shortage of flash memory chips. Price wars, rising interest rates, and market saturation can all conspire to dry up revenue streams. Even slowed growth from an otherwise profitable business can draw the ire of the board of directors. At times like these, a CEO begins to look less like a figurehead and more like a head rolling down the aisle.

And although it's lonely at the top, few CEOs are dropping expert advice about how to get there. You could hover in the background as a vice president for decades. However, once you get those three magic letters on your business card, you had better accomplish what you want to do before someone changes his or her mind. Of course, a pink slip at this level isn't so bad; after all, CEO severance packages are often worth more than a lesser employee may earn in an entire career. Plus, there's always the lecture circuit, consulting deals, the obligatory memoirs, or a CEO position somewhere else.

■ **Life After A Big Firm.** One trend that exemplifies the "no risk, no reward" school of thought is the number of former CEOs and top executives who have left behind a secure career to help establish an Internet startup company. Some of the most famous examples, in part due to the fact that they used to work for Microsoft, are RealNetworks' Rob Glaser, InfoSpace's Naveen Jain, and drugstore.com's Peter Neupert.

You may wonder why anyone would leave a choice job with a roadmap to a wealthy retirement to head a collection of arrogant 28-year-olds. Some cite a refreshing lack of bureaucracy; others point to the growth potential of a pet project outside of corporate restrictions on how it will mesh with the company's mission statement. Another consideration is the opportunity to be a CEO, which is a locked door to all but a select few in a large company. Judging by interviews with several high-tech expatriates-turned-CEOs, though, it seems the real reason may be to build something from the ground up.

Granted, heading a startup company is far different than heading a major corporation. A megacorporate CEO may be a mere figurehead at the higher levels whose boiled-down job is to keep the stockholders content. In the Internet startup realm, however, in which employees can be counted on two hands, a CEO may do everything from changing the entire business plan in an afternoon to cleaning the bathroom. Here, more than anywhere else, a CEO can motivate and inspire employees on a daily (and first-name) basis.

Besides startups, popular landing pads after jumping out of the corporate nest are consulting services, investment firms, and the lecture circuit. Another favorite new type of business is that of helping new businesses. These **incubator** firms provide assistance, advice, and sometimes cash to help a promising fledgling take wing. Often, incubators keep a stake in the new company as partial payment for their help.

■ **Impact.** Despite the Nasdaq reality checks, the Internet is still driving growth in the high-tech industry and fostering exotic experiments in online business models. However, many are still left wondering how society will benefit from all these new ventures in cyberspace.

"[It's] like the free market providing the capital for pure research, which never happened before," O'Deady says, referring to venture capital firms bankrolling Internet startups that are testing uncharted markets. "It will remain to be seen whether anything really useful came out of all that." O'Deady compares the present situation to the space program, which is a monumental example of government coffers funding scientific research, and how it yielded some useful consumer materials, such as Teflon and Velcro.

Regardless of the Internet's level of maturity, hardware vendors' thin profit margins, and the small percentage of profitable online ventures, there will continue to be strong demand for new blood in the industry. So sharpen your skill set and go make Sally Struthers proud. RS

by Marty Sems

GUESS WHO?

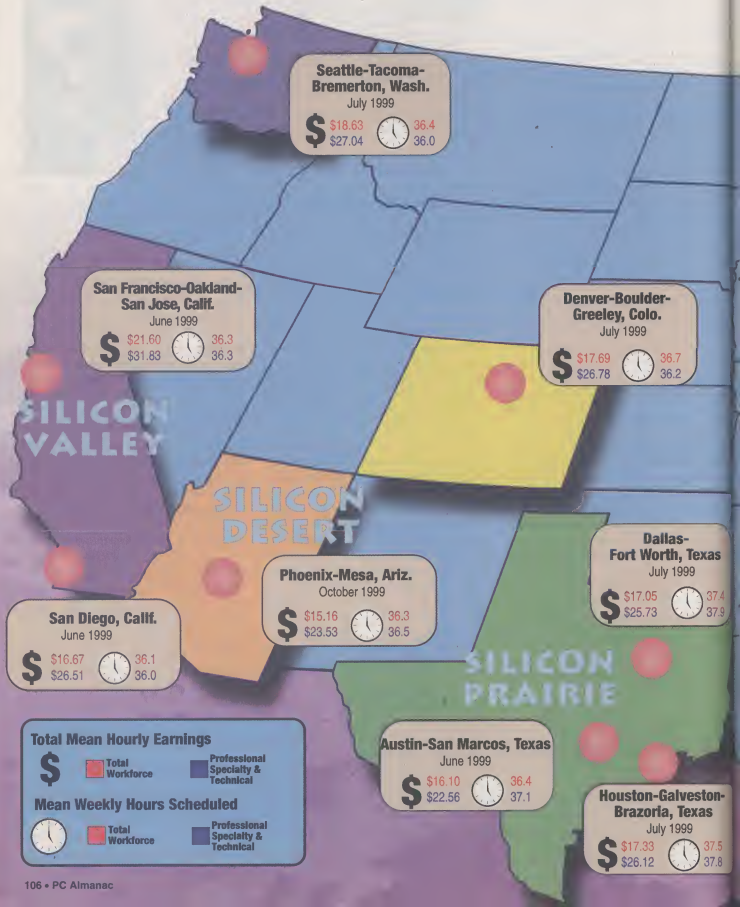
This unconventional computer pioneer, high-school dropout, and self-described "odd duck" coined the term "virtual reality" and developed many of the market's first components. Sporting dreadlocks, the VR entrepreneur, musician, and artist has worked with organizations as diverse as NASA and Atari during his career.

Answer: Jaron Lanier

Dates To Remember

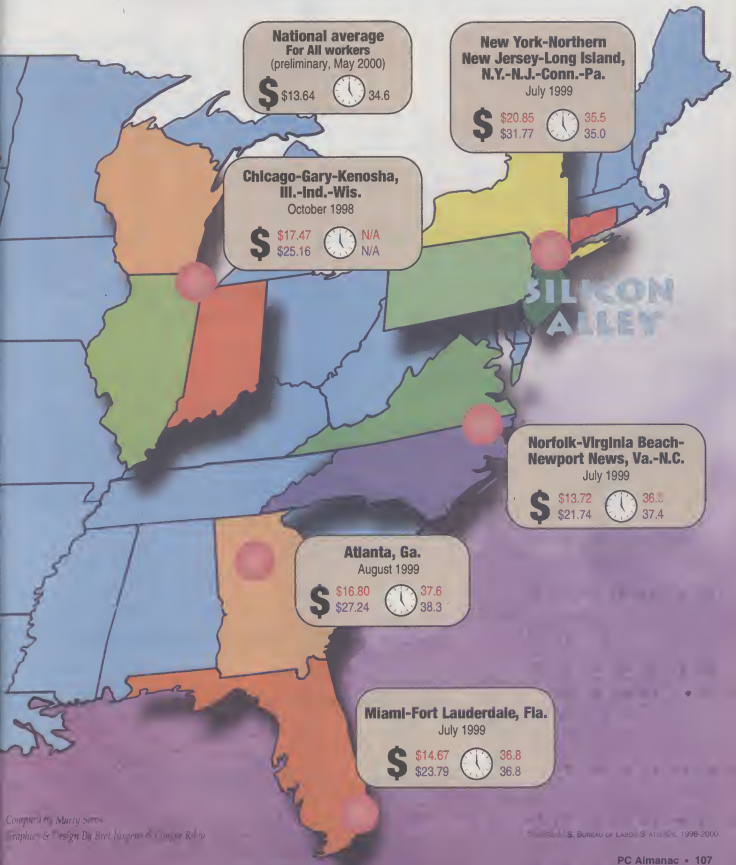
On Jan. 11, 1971, journalist Don C. Hoefler began a series of articles on the semiconductor industry in California for a weekly publication called *Electronic News*. He called the three-week series, "Silicon Valley, U.S.A." It was the first time anyone had used the term Silicon Valley.

The Silicon Workplace



High-Tech Wages & Workweeks

Is the grass really greener in Seattle than in San Jose? Maybe not from a pay perspective, but the high-tech workweek is shorter. Although the Bureau of Labor Statistics' professional specialty and technical category encompasses more than computer-related professions, it's a good indicator of the higher salaries (and often longer workweeks) that come along with a high-tech degree. Note the "me-too" area nicknames that chambers of commerce bandy about to demonstrate that their fair cities are just as techie as Silicon Valley.



Compiled By Marty Sierra
Graphics & Design By Bret Jaspers & Cooper Rebo

Source: U.S. Bureau of Labor Statistics, 1998-2000

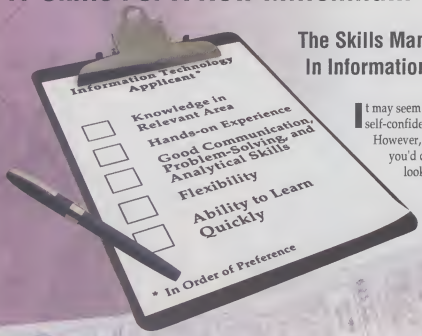
Squeezing Out San Francisco's Low-Income Residents

One of the biggest drawbacks to the tech boom in Silicon Valley is that it has displaced so many low-income people. For perspective, note that many well-paid workers who could buy at least a starter home in most U.S. cities can't afford even a one-bedroom apartment in parts of the Bay Area. The problem is much worse for the poor; the San Francisco Housing Authority tries to provide an island of affordable housing, but it's getting tougher every year.

25,143	Residents in public or leased housing
98%	Occupancy rate in public housing units
$11,000	Average income for SFHA families
3 years	Typical wait for a public or Section 8 (leased) apartment
$223	Average rent per month before federal and state subsidies
30%	Percentage of each public or leased household's income paid in rent

Source: San Francisco Housing Authority (July 2000)

Bridging The Gap: IT Skills For A New Millennium



The Skills Managers Look For In Information Technology Applicants

It may seem that all you need to land a tech job in high-demand areas is self-confidence and the ability to change your Windows wallpaper. However, if you want to land a good job in information technology, you'd do well to back up that confidence with a skill set managers look for.

Source: Market Decisions Corporation for the Information Technology Association of America, April 2000

IT Demand Outstrips Supply

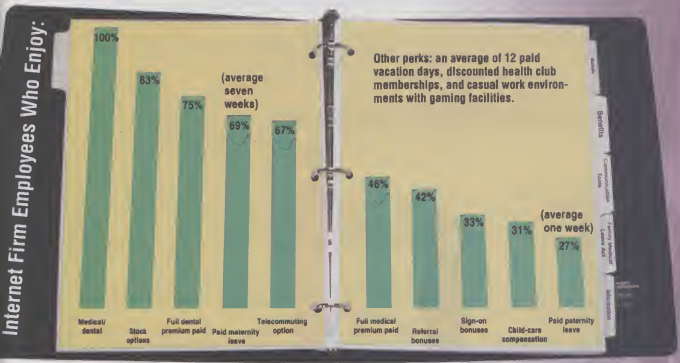
California experienced its first gold rush in the 1840s and 1850s, but there's another one happening today. Internet startups may come and go, but there will continue to be strong demand for information technology workers in any business that has a network, works with its own proprietary software, or has a presence on the Internet.

New IT jobs (2000)	**1.6 million**
New jobs expected to go unfilled	**843,000 (53% of total)**
New IT jobs that require Web-related skills	**13% of total**
New IT jobs that require database-development and software-engineering skills	**20% of total**
IT vacancies in smaller non-IT firms	**70% of total**

Source: Market Decisions Corporation for the Information Technology Association of America, April 2000.

Do dot-com workers really get all kinds of crazy perks? Besides the obligatory "come as you are" dress code, Internet firm employees are likely to have stock options, paid maternity leave, and the option to work from home.

Internet Firm Employees Who Enjoy:



SOURCE: "NEWSALERT LEADS THE WAY IN RECOGNIZING INTELLECTUAL CAPITAL WITH A STUDY ON IN-DEMAND EMPLOYMENT TRENDS" BY K. RUSSO ASSOCIATES FOR NEWSALERT, JUNE '00.

Who's Quitting?

Voluntary Turnover At Major High-Tech Firms

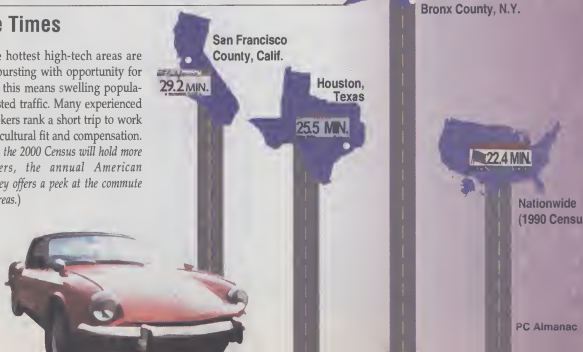
Ex-Microsoft employees and executives have been getting a lot of attention this year in their various new ventures, prompting speculation about a "mass exodus" taking place from the Redmond giant. We checked with other major Internet and computing firms and found Microsoft does have a higher voluntary attrition rate (the percentage of workers who quit) than Oracle or Cisco.

	Voluntary Yearly Attrition Rate	Total Employees (approximate)	Employees Leaving (approximate)
IBM	"significantly less than 10%"	300,000	< 30,000
Microsoft	9.6	35,000	3,360
Oracle	5.7	41,320	2,355
Cisco	5.6	30,589	1,713

(SOURCES: COMPANY SPOKESPEOPLE AND/OR WEB SITES)
INDUSTRY AVERAGE 18.1% (SOURCE: MICROSOFT, ATTRIBUTING THE SARATOGA INSTITUTE.)

Commute Times

Although the hottest high-tech areas are practically bursting with opportunity for skilled workers, this means swelling populations and congested traffic. Many experienced high-tech job-seekers rank a short trip to work just as highly as cultural fit and compensation. (*NOTE: Although the 2000 Census will hold more complete answers, the annual American Community Survey offers a peek at the commute times in selected areas.*)

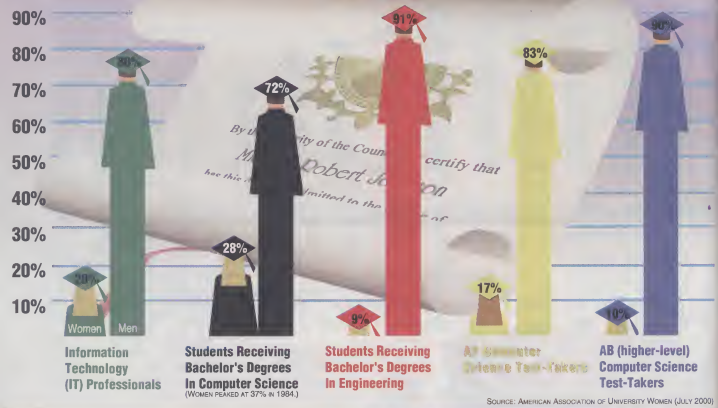


SOURCE: U.S. CENSUS BUREAU, AMERICAN COMMUNITY SURVEY (1999)

Tech-Savvy: Educating Women For The New Computer Age

For whatever reason, women seem to be drifting further and further from the technical side of the computer and Internet industries. Steadily fewer women have been seeking bachelor's degrees in computer science since 1984. Here's a snapshot of the situation from the American Association of University Women (July 2000).

Womens' Representation In The Computer Industry



Source: American Association of University Women (July 2000)

Median Home Resale Price (Second Quarter 2000)

Forget getting what you paid for because incredible demand is driving up housing prices in hot high-tech cities. Even more important than demand are the monstrous dollar amounts in the hands of nouveau riche Nasdaq millionaires who want to move in right now. Note that because cities in Texas have more room to grow, home prices are a little more reasonable there.

Austin-San Marcos, Texas	$155,000
Chicago, Ill.	$179,000
Dallas, Texas	$145,000
Denver, Colo.	$180,000
Houston, Texas	$123,000
Los Angeles-Long Beach, Calif.	$202,000
New York, N.Y.	$209,000
Norfolk-Virginia Beach-Newport News, Va.	$116,000
San Francisco, Calif.	$510,000
San Jose, Calif.	$448,000
Seattle-Bellevue-Everett, Wash.	$213,000

Source: National Association of Housing Builders "Housing Opportunity Index 2Q 2000".

Wages In Computer-Related Jobs

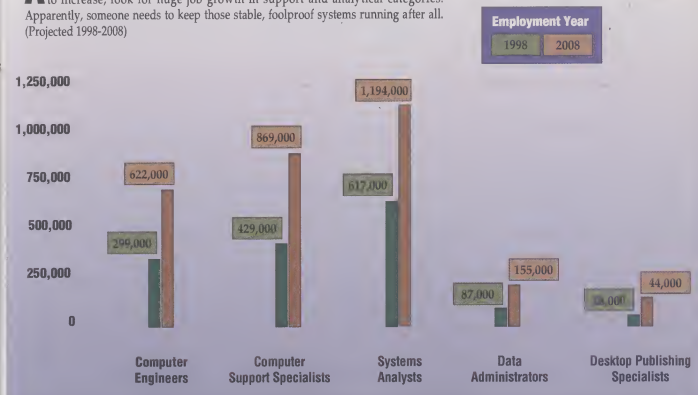
It reminds us of the post-graduation scene in "The Graduate." "I just wanna say two words to you. Just two words. Are you listening? Information Technology." OK, we know Dustin Hoffman was being nudged toward a career in plastics, but this is 30 years later. The plum jobs today appear to be in databases and software engineering, with a Webmaster's value recognized with very nice compensation. As always, though, managers and VPs pull down the big bucks.

	Mean Avg. Salary (Jan. 2000)	Avg. Maximum Salary	Avg. Bonus, if any
Data Entry Operator I	$19,477	$24,387	$479
Data Entry Manager	$33,715	$40,638	$999
Computer Operator I	$24,150	$28,865	$588
Computer Operations Manager	$59,333	$76,520	$2,123
Help Desk Operator	$30,165	$37,144	$665
Webmaster	$61,180	$78,642	$1,845
Webmaster (e-commerce)	$76,432	$101,973	$3,010
Database Analyst/ Programmer I	$44,825	$54,089	$1,069
Database Manager	$71,028	$88,806	$2,010
Software Engineer	$66,232	$88,988	$2,323
Vice President, Information Services	$147,243	$212,027	$20,133

SOURCE: WAGEWEB.COM (HUMAN RESOURCES PROGRAMS DEVELOPMENT AND IMPROVEMENT, JULY 2000 SURVEY)

Top 5 Fastest-Growing Occupations

Although the government expects the demand for software, especially databases, to increase, look for huge job growth in support and analytical categories. Apparently, someone needs to keep those stable, foolproof systems running after all. (Projected 1998-2008)



SOURCE: U.S. BUREAU OF LABOR STATISTICS (FEB. 2000)

Moving At The Speed Of Cash

What It's Like To Work & Succeed In High-Tech

If you believe everything you hear about the computer and Internet industries, everyone involved is an arrogant 28-year-old startup firm CEO; a teen-age millionaire; or at the least, in possession of unearthly inside knowledge and killer pre-IPO (Initial Public Offering) stock options. If that jives with your worldview, read on for a better perspective. Although mostly mythical, there are grains of truth in each of these.

■ The Truth Behind The Myths. "They're smart, they're well-educated, they work really hard [with] long hours, they are very naive, [and] they've got typically no prior business experience," says Mark O'Deady, managing director and chief executive officer of Connect The Dots. "And, they're running as fast as they can toward whatever goal it is that they're shooting for."

The present stereotype of the abrasive 28-year-old tech worker fits employees in Internet startups more than those in traditional hardware and software companies. For one thing, startups thrive on hype and long hours, which require certain "younger" personality traits. For another, it's easy to get an inflated view of one's own importance when not surrounded by experienced veterans.

Finally, easy cash influx, whether from a soaring IPO or an enthusiastic venture capital deal, sends a message to some young entrepreneurs that no decision is necessarily a bad one. "That has created kind of a cavalier [attitude] that you didn't see in previous groups of entrepreneurs," O'Deady says. "The term 'OPM' [other people's money] was kind of an insider's term, and now it's much more widely used in a cavalier way."

Gaby Adam, a senior vice president with DDB Worldwide Communications, has represented numerous computer and Internet firms in the Seattle area in a public relations capacity at both DDB and Waggener Edstrom. She agrees there is something to the stereotype although she says the situation has recently changed. "Before the [Nasdaq market] correction," she says, "there was . . . a feeling like everyone was almost arrogant about being in the tech world." Adam explains this was fueled by the vast opportunities and rewards awaiting motivated workers in Internet businesses, which tended to skew the expectations of young entrepreneurs.

Just the Facts!

The three fastest-growing occupations in the United States are computer scientist, computer programmer, and computer support specialist. (Sources: Bureau of Labor Statistics and America's Career Infonet)

In reality, however, most startup founders are white males aged 42.6 years old who have had years of management experience but none with an Internet company. Only 1% are younger than 25 ("State of the Startup," The Standard, June 2000).

As for Internet millionaires still in their teens, they are very few and far between. Despite all the publicity young code-writing hobbyists-turned-entrepreneurs may receive when they sell their "companies" to high-tech firms, such stories aren't very representative of the real world. Although *m*illionaires are somewhat plentiful, and thus hard to track, in October 1999 Forbes had only one *b*illionaire younger than 30 in its list of the top 100 richest Americans, Daniel Morton Ziff, age 27.

Bill White, head of affluent marketing consulting at Spectrem Group would caution the few lucky Internet millionaire teens that skipping further education because of their new wealth might hurt their earning potential later. "Bill Gates did it [without harm], but few others," White says.

Another myth that wasn't quite so mythical a year ago is that every well-known private Internet company is on track for a stellar IPO, and anyone who bought stock at the ground floor will prosper wildly. The truth is that for every hot first-day performer, such as VA Linux Systems or theglobe.com, there are scores of other IPOs that don't exactly catch fire. Not only is the promise of an imminent IPO no longer magic but it also may be a turnoff to prospective employees who follow such things.

■ High-Tech Workers. Even though IPOs are chancy propositions, high-tech stock prices have buoyed the fortunes of computer company workers in most sectors. Because many computer firms offer stock or other performance bonuses to their employees, almost everyone, from management to the factory floor employees, can share in the company's profit. As always, though, sales and management personnel command compensation packages above the rank-and-file employees. However, systems analysts, programmers, Webmasters, and database coordinators are now being paid more than ever.

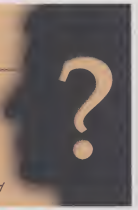
Lacking the stability of more established firms, many Internet startups have come to rely on stock options to lure talent away from other companies. However, volatile stock performance and an almost universal lack of profitability among dot-coms often mean dwindling enthusiasm for an option-heavy

Dates To Remember

On October 28, 1955 William H. Gates III was born to Seattle attorney William H. Gates II and schoolteacher, University of Washington regent, and United Way International chairwoman Mary Gates. Gates grew up in Seattle with his parents and two sisters and began programming computers at age 13.

GUESS WHO?

Having grown up with parents active in the Communist Party, he looked to technology for humanity's answers. After coining the term "artificial intelligence" and creating the LISP language for AI applications, he became involved with the 1960s counterculture movement.



Answer: John McCarthy

compensation package. Management consultants Hay McBer said on Nua Internet Surveys (http://www.nua.ie/surveys; May 2000) that e-commerce employees will demand better salaries as share options lose their glow. Many new recruits, whether for entry- or executive-level jobs, are likewise more interested in high wages and a signing bonus right now.

Because stock options are so risky, they can backfire. Persistently low stock prices can counteract efforts to boost morale in a stumbling business trying to get back on its feet. In a worst-case scenario, a company's pathetic stock price could depress the entire workplace. However, things change rapidly in the industry; a wild surge in the market can put the grins back on those dour faces overnight.

Despite high-profile layoffs from time to time, computer and Internet industry workers are enjoying tremendous demand for their services, excellent overall benefits, and continual challenges. Many have the opportunity to do something no one has ever successfully done, just as eBay's employees brought instant auctioning power to the world. Others may be biding their time, quietly moving up the ladder as top executives jump ship for other ventures. Still others are gaining the business or technology experience they need to start the next phase of their careers, such as freelance consulting or an executive job at another company.

Hopefully, computer and Internet industry workers are also making enough to live in the same area they work. We're not talking about gung-ho startup denizens who camp out in the "live/work" areas in their place of business; we're talking about being able to afford a house or apartment within a half-hour's commute to the office. It may seem strange to an outside observer that a computer engineer may not make enough to get even a starter home, but that's the reality in much of San Francisco and the Silicon Valley.

O'Deady shared an anecdote about why many high-tech workers choose to live entire states away from the crown jewel of the tech world. One of his friends works in technical sales in Texas. For years, O'Deady says, his friend has adamantly refused Silicon Valley recruiters' efforts to get him to relocate.

According to O'Deady, his friend has explained to recruiters that in order to move to Silicon Valley, he would require a house, neighborhood, and nearby school system that are comparable to the ones he enjoys in Texas. "'The relocation package is going to have seven digits,'" O'Deady quotes with a laugh, "'and what we're going to argue about is what the first number is.'"

Housing issues aside, it's a very prosperous time overall for the computer and Internet industries. And that has some observers, such as Adam, feeling wistful. "I think what happened over the years is that a lot of people came in the industry driven by money," Adam says, which is in contrast to her view of the "old school" who were driven more by love for the technology.

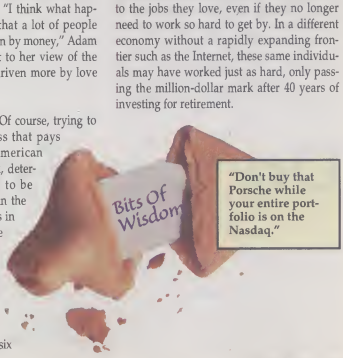
■ **The New Rich.** Of course, trying to break into a hot business that pays extremely well is the American way. Through hard work, determination, and the luck to be holding the right degree in the right year, a lot of workers in the dot-com economy are finding themselves rich.

Who wants to be a pentamillionaire? Spectrem Group's Bill White says the affluent class is consistently growing at about five or six times the rate of U.S. population growth. He cites several factors for the trend, such as the swelling ranks of high-earning middle-aged people, sustained double-digit growth in new business formation, and privatization of retirement funds. He says other key factors are stock options (both technology and otherwise) and the opportunity for skilled workers, such as those in computing and Internet companies, to be paid according to the value they bring to the business.

White says the fastest-growing group is at the very high end. Five million dollars or more will qualify you for "pentamillionaire" status, which seems to be a more realistic qualification for real wealth today than the more pedestrian "millionaire" goal.

"You don't get to be a pentamillionaire by saving," White says. "You get there by having some kind of an equity stake in some commercial activity. Entrepreneurial activity and the equitization of income are really driving the high end." The Internet, and especially e-commerce, has opened the door to entrepreneurs as never before.

Money changes everything? More people may be striking it rich, but it's clear that the nouveau riche of today are not behaving like the "old money" individuals, which now refers to anyone who didn't make their fortune in computing. Sudden wealth—perhaps owing more to the überbull market than skill—hasn't changed the new breed's working-class ethics. Most still feel compelled to commit enormous amounts of time and effort to the jobs they love, even if they no longer need to work so hard to get by. In a different economy without a rapidly expanding frontier such as the Internet, these same individuals may have worked just as hard, only passing the million-dollar mark after 40 years of investing for retirement.



In addition, today's brand of affluent American goes to great lengths to avoid looking affluent. In other words, most dress the same way as before without suddenly adopting "rich" mannerisms and silk suits. However, when it comes to homes and the toys they have in them, anything goes. Big wired houses that are secluded from prying eyes are obligatory expenses for the new rich.

"They want to have a nice house, and they're willing to spend [to get it]," White says. "Certainly their discretionary spending is finding their way into luxury goods [and] cars . . . Porsche and organizations like that are having very good years." In Silicon Valley, you can drive a Porsche without guilt because so many other people do, too.

White sees the new breed as much more aggressive than the traditionally wealthy. "Financially, [they're] more self-empowered people who want more control over their money," he says. The new affluent class also would rather collaborate with a financial advisor than merely obey his or her advice, he adds. "They're also . . . much more likely to want to redeploy their wealth into creating more."

Finally, almost none seem to do what barstool lottery hopefuls have talked about for decades: quit work and go fishing every day. Many do change jobs or start their own ventures, seeing their new wealth as more of a safety net than an early retirement account. Often, financial security gives dreamers the confidence they need to embark upon their "life's work," whether that's helping inner-city kids learn to use the Internet or helping promising new startups get a toehold in the market.

The broad view. The Internet's promise is to "bring it to the people," whether "it" is information, interaction, or access to a very public forum. In this case, the "it" we're referring to is a whole lot of money.

As Internet stockholders became New Economy millionaires seemingly overnight, America saw a trend toward the popularization of wealth. Instead of a small class of rich people slowly getting richer at the expense of others, new wealth was actually created, along with a new generation of affluent individuals. The obvious question posed by this year's market correction is whether these newly minted riches are in danger of evaporating.

The main danger, according to White, is when someone's new wealth is tied up in "risky, concentrated portfolios." In other words, if your big assets are concentrated in a single Internet company's stock, they can disappear with a sudden market shift. All it takes is a less-than-inspirational financial report or a missed business opportunity, and a narrowly focused Internet company can find itself in a tailspin.

White says a financial advisor can help someone in this situation decide what to do to preserve his or her wealth in a more stable portfolio. He also wants to remind stockholders there are other types of businesses contributing to the present economy that can help diversify their portfolios. "Even though technology has been visible, it's not the only source of drive behind these kinds of numbers," he says.

If you're lucky enough to become really, really rich and you're at a loss for advice you trust, former Netscape co-founder and chairman Jim Clark may be able to help. Clark founded myCFO.com (http://www.mycfo.com) to provide the services of a virtual CFO (chief financial officer) to the wealthiest individuals. The service offers flexible, personalized services, such as bill and tax processing, investment advice, and estate planning. It also offers advice for making charitable donations.

Leaving a legacy. Once high-tech millionaires get over the initial shock of their new status and begin to feel real financial security, there comes a point at which many start to look outward. In the early and mid-1990s, computer-industry millionaires and billionaires got a reputation for stinginess when it came time to give to others. This seems to have changed, and not only to avoid bad publicity. Some newly rich people feel that because their new wealth was unexpected, it wouldn't hurt to give part of it to charity. Many have specific causes in mind, such as education and medical research, to which they finally feel able to contribute.

One way the New Economy superrich are having an impact is by starting their own charitable foundations. The Bill and Melinda Gates Foundation gets most of the press these days, which from an asset and donation standpoint, is entirely justified. According to a spokesperson, as of August 2000 the Gates Foundation had given away $976 million and had $21 billion in assets. All this astounding giving has taken place since the start of the William H. Gates Foundation (the first part of the Bill and Melinda Gates Foundation) in 1994.

The Gates Foundation's list of causes includes education and health care (both domestic and international), as well as the more contemporary push to increase everyone's access to information. Gates and many other modern philanthropists seek to bridge the gap between those who can access

They Said It...

"I have come to believe that if anything will bring about the downfall of a company, or maybe even a country, it is blind copies of e-mails that should never have been sent in the first place."

-Michael Eisner, Disney chairman, San Jose Mercury News, May 19, 2000.

Do You Know...

which English computer pioneer had a chain of retail software stores named after him?

Charles Babbage, sometimes called the "Father of Computing," was a contemporary of Charles Darwin and Charles Dickens and designed an early precursor to modern computers called the Difference Engine. Although it was never completed, Babbage set to work on a more advanced computing machine called the Analytical Engine and is also credited with having invented the speedometer, uniform postage, and the first air conditioning in London. Grapevine, Texas,-based Babbage's Etc. is a nationwide mall retail chain that sells software and computer accessories.

Two Nanoseconds In The Valley

The epicenter of the computer and Internet industries has been lionized, demonized, loved, and loathed (sometimes all at once). Silicon Valley, Calif., draws engineers and entrepreneurs the way Los Angeles draws aspiring starlets. The area has even been the target of a plot in a James Bond film, "A View to a Kill." Never before, though, has Silicon Valley meant so much to so many people.

"It's an exciting place to live," says Mark O'Deady, managing director and chief executive officer of Connect The Dots, a consulting company in Mountain View, Calif. "It's kind of a gold fever that runs through the Valley. There's this belief that if you just happen to be standing in the right place at the right time, you'll be showered with enormous wealth."

The Silicon Valley region sprawls well beyond the actual Santa Clara Valley, which is south of the San Francisco Bay. The Bay forms the Valley's northern boundary while rugged mountains contain it to the south and west. The Valley's chief cities include San Jose, Palo Alto, Mountain View, Santa Clara, Cupertino, and Sunnyvale. However, O'Deady says the Silicon Valley region stretches northwest all the way to San Francisco and as far northeast along the Interstate 880 corridor from Fremont to Richmond and along Interstate 680 from Milpitas to Walnut Creek. San Jose, the county seat of Santa Clara County, is the self-proclaimed "capital" of this odd realm.

O'Deady, who has lived in the area for more than 40 years, is careful to point out that the Valley's technological roots go back further than Apple in the 1970s. They even go further back than William Shockley's semiconductor laboratory near Palo Alto, which was the birthplace of the silicon transistor in the 1950s. O'Deady says the aeronautical engineering and research at Moffett Field Naval Air Station preceded all of the computer-centric technology that is now synonymous with the Valley.

Today, Silicon Valley is home to Cisco, Intel, Sun Microsystems, Oracle, Hewlett-Packard, Palm, Handspring, Apple, AMD, 3Com, Silicon Graphics, and other substantial high-tech companies. O'Deady says a "magic" mix of academic institutions, ready investment capital, and technologically skilled workers has sustained the Valley's enormous growth even after government funding became less important to area businesses' research than the free market.

Politically, the Valley has a Democratic majority, "but with a very conservative underlying tone," O'Deady says. "[This is] oftentimes set by the people who gain wealth and become more conservative almost immediately." O'Deady acknowledges that Internet and computing entrepreneurs in the area also seem to have streaks of libertarianism in their makeup, and that brief alliances to achieve a specific civic or business goal are far more common than long-term loyalty to one another.

Of course, Silicon Valley, San Francisco, and the Bay Area are not without their problems. The energy-craving nature of the computing industry and the millions of air conditioners in the region contribute to power shortages. However, the worst problem is an inflationary housing market that is fueled by high demand from rich and acquisitive stockholders and exacerbated by tight living space among the mountains and shorelines.

"It's absolutely outrageous," O'Deady says. "A real estate crash in Silicon Valley means that the prices flatten out for a couple of years."

The severe housing crunch is displacing even the traditionally middle-class infrastructure workforce, such as teachers and police officers, not to mention the poorest segment of society. "There's a huge homeless population in the San Francisco Bay Area," O'Deady says. "While there are things being done about it, not enough is being done about it."

Some generous residents are combating homelessness in the most direct way possible: donating a house. In June 2000, CNN's Don Knapp reported on a couple in upscale Los Altos who cleared the land for their new house by donating the existing structure to the poorer city of East Palo Alto. The couple paid the cost of moving the house and received a tax break as a thank you.

The upscale residents of the area also get in on the philanthropic act. Each year's Silicon Valley Charity Ball gathers donations from the local elite. Meanwhile, Community Foundation Silicon Valley helps individual and corporate donors target their gifts while local high-tech giants, such as myCFO's Jim Clark and eBay's Pierre Omidyar, have laid the groundwork for educational and nonprofit group aid in separate ventures.

Despite its problems, Silicon Valley has a lot going for it besides the companies that helped make it the mecca of the high-tech world. It has a well-educated population, highly regarded universities and schools, excellent weather compared to most of the country, and a thriving job market.

"You put all these things together, and the negatives don't seem so bad," O'Deady says. □

and use computers and the Internet and those who are too poor or disenfranchised. Observers have dubbed this gap the "digital divide." Their hope is that because the Internet has been the most popularizing media to date, helping the "have-nots" learn how to effectively use the Internet will give them a powerful tool to help themselves.

"It's kind of interesting," O'Deady says, "as opposed to the robber baron days of early California history, where [media tycoon] William Randolph Hearst and Stanford, who was a railroad magnate . . . bought land and things to possess, the 'robber barons' of Silicon Valley have kind of turned to giving it away."

Foundations and other charitable trusts are nothing new, but truckloads of money are certainly a novelty to the present crop of high-tech millionaires. Still in possession of their middle-class values and remembering their humble lifestyles before the Nasdaq elevated them, the new rich are aware of the social and economic problems around them. Fortunately, many are also willing and eminently able to help.

One Seattle resident, who asked not to be identified, related a story that, she says, illustrates just how able to help a millionaire can be. She was out one night with a friend, who happened to be a vice president at Microsoft. The conversation turned to philanthropy: "I was saying, 'You know, I've just got to start giving more to charity . . . maybe join a volunteer organization or something.' And he says, 'Oh yeah, that

Quick Tips

Remember, if you give out your e-mail address to a Web site, you lose control over that information and leave yourself open to spam (unsolicited e-mail). Of course, you sometimes need to give out an e-mail address on the Web. If you buy something online for instance, you'll want to provide a valid e-mail address. You can sign up for a free Web-based e-mail account from a service such as Hotmail. You can then give your Hotmail address to Web sites while keeping your private inbox reserved for friends and family.

GUESS WHO?

This British inventor of the world's first universal digital computer, the mechanical printer, and uniform postal rates was once lowered into Mount Vesuvius so that he could observe molten lava. He also has a crater on the moon named after him.

Answer: Charles Babbage (1791-1871)

reminds me. I've been meaning to start a foundation.'"

■ **Influence.** Throughout history, the oil barons, media moguls, and the people in charge of the Big Three automakers (General Motors, Ford, and Chrysler) all realized their interests made them vulnerable to changes in the legislative landscape. At the same time, each group realized it was economically and politically important enough to influence the people who make those changes.

Eventually, every powerful industry takes its first ambassadorial steps toward Washington, D.C, and the computer and Internet industries have already done so. Their representatives and spokespeople have lobbied Congress about a variety of New Economy issues, including the export of encryption software, digital signatures, and proposed taxation of Internet transactions.

"Silicon Valley [executives] are getting a lot more politically savvy and involved in the political process, which is to say they're giving lots of money to politicians and causes," O'Deady says. "Whereas the tradition in Silicon Valley was pretty much to ignore what went on in Washington and Sacramento."

John Doerr, a partner at venture capital firm Kleiner Perkins Caufield & Byers and a key figure in the investments behind such firms as Amazon.com, Sun Microsystems, and drugstore.com, also was a pioneer in forging a connection to Washington, D.C. In 1996, Doerr struggled to get a politically uninterested Silicon Valley to band against a state proposition. Afterward, he realized the introverted high-tech industry could no longer ignore state and federal bills that

Come As You Are

Before the 1990s, Seattle had a low-key, positive reputation. It was where you lived if you loved the Pacific Northwest but still craved a big-city cup of coffee.

Then came Kurt Cobain, Nirvana, and the grunge-rock scene. After that it was Bridget Fonda in "Singles" and Tom Hanks and Meg Ryan in "Sleepless in Seattle." Then came Starbucks—everywhere. And, of course, then Microsoft ascended as the de facto standard operating system provider for desktop computers worldwide.

Technically, Microsoft is based in Redmond, which lies east of Seattle across Lake Washington. However, its impact on the area is undeniable. Bill Gates and crew have created their own version of Silicon Valley, complete with massive technological research and development, a new class of millionaires, and soaring home prices in nearby areas, such as Bellevue and Woodinville.

Internet startups surround the Seattle area like they do in Silicon Valley, San Francisco, and Manhattan. There's Amazon.com, InfoSpace, RealNetworks, HomeGrocer, and Go2Net, just to name a few. And yes, many of them have "come as you are" dress codes, so twenty-something employees can wear their old flannel when they're feeling nostalgic.

A fair number of new Seattle-area businesses were founded by ex-Microsoft employees, such as Ramesh Parameswaran (Askme.com), Brad Silverberg (Ignition), and Rob Glaser (RealNetworks). "They've touched just about every startup around town," says Gaby Adam, a senior vice president with marketing and advertising firm DDB Worldwide Communications.

The so-called "executive exodus" from Microsoft is actually worse than the turnover at other high-tech companies. According to company spokespeople and information gathered from their Web sites, the annual turnover at Microsoft is 9.6%, compared to Oracle's 5.7% and Cisco's 5.6%. Some of the ex-Microsoft people have said in interviews that they left for new ventures partly to relive the competitive spirit of Microsoft's earlier days. Others said they grew frustrated with the rapidly expanding company's ponderous procedures while the Internet economy dashed in every direction at once.

Adam takes a more entrepreneurial view. "Part of what they're after is to show the world that they can make it on their own without the infrastructure of Microsoft behind them," she says.

Seattle itself has benefited over the years from Microsoft's success, both from its effect on the local economy and the overall intelligence of its employees.

could seriously affect its business, according to Mercury Center (http://www.mercurycenter.com; "Power in Silicon Valley," July 30, 2000).

Industry moguls may now keep an eye on Washington, but that doesn't mean they're ignorant when it comes to local matters. Mercury Center reported that James Morgan, chairman and CEO of Applied Materials, raised money to help pass an $80 million bond issue that would allow a school district in San Jose, Calif., to renovate its schools.

It's important to realize, however, that many of the most influential people in the industry are still taking care of business. Few spend a great deal of time on public issues because they're too busy working. However, they're still aware that sometimes the most crucial work to be done may be in the state or nation's capital.

The Bottom Line. We've seen how the computer and Internet industries have been kind to most of its workers and provided the springboard to rapid riches for a whole passel of executives and entrepreneurs. But is American society as a whole better off or worse off because of it?

It's hard to convince the artists and colorful individuals evicted from their lofts in San Francisco that it's nothing personal when a cash-flashing 28-year-old offers to pay triple the rent. It's also difficult to cheer up "right-sized" employees who lost their jobs in a restructuring "to better focus on the core business" because of a grossly naive business strategy.

On the other hand, the computer and Internet industries have helped sustain an unbelievably healthy economy for years. Essential applications such as e-mail have prompted members of every generation to learn how to use computers. And there's no doubt that we've only begun to realize the usefulness of the World Wide Web for education, personal growth, commerce, and civic activism.

In addition, supercomputer-aided technical research is thriving, propelling advances in surgical techniques, automotive design, and even weather-prediction systems. Internet users are becoming adept at online trading, auctioning off their white elephants, and e-mailing digital photos to friends and family around the world minutes after taking them. And, aspiring authors, artists, and musicians have more opportunity than ever to find a devoted audience. Despite the drawbacks, the computer and Internet industries are far more of a benefit than a curse. RS

by Marty Sems

Do You Know...

how much money Michael Dell invested to start Dell Computer?

In 1984 a 19-year old Dell began Dell Computer Corp. with an initial investment of just $1,000. Today the company employs approximately 37,000 people in 34 countries around the globe and boasts $50 million in daily online sales. In August Dell Computer ranked 56th on the *Fortune* 500 with more than $25 billion in annual revenue, and *Forbes* reported Michael Dell's personal net worth at $17.8 billion.

However, residents are quick to point out the city's diverse culture and other industries are independent of Redmond. "It's certainly not a case of people coming to Seattle, then falling into tech jobs," Adam says. "Seattle's a pretty desirable place to live. It's not too hard to pull them here."

Desire translates into higher housing costs although they aren't as bad as Silicon Valley's. Seattle is still constrained by Puget Sound, Lake Washington, and mountainous terrain. These right quarters naturally drive home prices a little higher. The demand from wealthy high-tech employees who pay cash doesn't help matters either, unless you're a landlord or you're selling and leaving town.

Add a maze of problematic waterways and bridges, and come rush hour, there's a frustrating commute. Many of Microsoft's approximately 35,000 employees live in Seattle and must drive to work across Lake Washington every day. Westside.com founder and ex-Microsoft employee George Snelling described the commute in Fortune (July 10, 2000) as "crossing] a very wide lake over a very narrow bridge." The inference is that for a variety of reasons, it's a pain for "west side" residents who live in Seattle to work on the "east side" at Microsoft. In fact, Adam says many of the startups that got their starts orbiting Redmond and Bellevue have now moved across the lake to be closer to the majority of their employees in Seattle.

Still, Microsoft's stock price is still pretty good, and no one disputes that the software company has been generous about sharing its fortunes with its employees. Hence the "Microsoft millionaires," who are thousands of workers fortunate enough to own Microsoft stock long enough for it to punch through the magic million-dollar mark.

Money in hand and ready to live near work, Microsoft execs and middle managers have colonized east-side cities, such as Woodinville, Redmond, and Bellevue. The east side has long been characterized as a "lily-white, country-club" area by some Seattle residents, and the palatial homes Microsoft millionaires are building there haven't done much to dispel the notion. This cultural gap is part of the reason why Seattle prides itself on its unique identity, even while acknowledging Microsoft's role in its present prosperity.

"There's a lot more money circulating around," Adam says. "There's maybe a few more symphony and opera events . . . but I don't think [the city] has changed too much. Seattle's really a pretty down-to-earth place."

Movers & Shakers

The People Who Created A Buzz This Year

Whether you're a twenty-something dot-com millionaire or the CEO of a Fortune 500 company, making it to the top of the pay scale doesn't mean much unless you continue to incorporate fresh ideas to keep the company afloat. There's little doubt that the computer industry, whether in Silicon Valley or on the Silicon Prairie, is flooded with intelligent people, but every year there are a few standouts that deserve extra attention.

The people on these pages introduced new technology, took the reins of a flailing company, encouraged investors to finance new companies, and resigned from a top post. They come from a wide range of backgrounds, including new dot-com companies, established firms, and financial groups. Here, we feature CEOs, retirees, venture capitalists, market analysts, and the newest stars in the dot-com universe.

Craig Barrett

President and CEO, Intel

According to his Intel biography, Craig Barrett takes the stairs to his fifth floor office. Besides the trek up and down the stairs, Barrett spent the past year on his feet while traveling the world looking for e-market opportunities and promoting global e-business. He also encouraged training educators to use computer hardware, and he spoke at educational conferences to highlight the importance of effectively teaching technology to students.

Intel promoted Barrett to president in 1997 and CEO in 1998. He started at the company in 1974 and worked his way up the ranks as technology development manager, vice president, senior vice president, and chief operating officer. After more than 25 years with Intel, Barrett doesn't show any signs of slowing down. Under his direction, Intel expanded its scope, introducing new technologies, such as **peer-to-peer-computing.**

Peer-to-peer computing became very popular this year with Napster and Intel foresees the technology will be useful in business environments. Peer-to-peer computing lets all the systems connected to a network share data and resources, such as processing power and storage space. This kind of setup could reduce the strain on company servers by taking over basic server tasks, such as virus protection.

Also this year, Barrett announced the introduction of Intel Solution Centers, which will help promote e-business around the world. The centers will allow foreign customers access to the necessary hardware and software to test and implement e-business solutions.

With these new global e-business ventures, Barrett also urged European governments to make Internet access more affordable.

In his role as CEO, Barrett has acknowledged company success and shortcomings. For example, when Intel recalled its new 1.13GHz (gigahertz) chips in late August, Barrett publicly announced the company could have done a better job.

John T. Chambers

President and CEO, Cisco Systems

Industry insiders recognize John Chambers as the driving force behind Cisco Systems, and Cisco has rewarded him by paying him the highest executive salary in Silicon Valley. Chambers began his career at Cisco as senior vice president in 1991, and in 1995 became the company's third CEO. Under the guidance of Chambers, Cisco set records as the fastest U.S. company to reach $500 billion in market capitalization (the number of outstanding shares multiplied by the present price per share). Cisco produces networking equipment and makes approximately 80% of the routers and switches used on the Internet to transfer data.

Since Chambers became president and CEO, the company's annual revenues have grown from $1.2 billion to more than $17 billion, and the profits continue to roll in. In its fourth quarter earnings results (Cisco's fiscal fourth quarter ended at the end of July 2000), Cisco posted net sales of $5.72 billion, an increase from the $3.56 billion of net sales posted during the same quarter the previous year. The quarter also signified the end of Cisco's fiscal year, which saw net sales come in at $18.93 billion, compared to $12.17 billion for the previous fiscal year.

As CEO, Chambers stresses the importance of customer service, Internet sales, and manufacturing. With Chambers at the helm, Cisco has merged with or acquired a number of companies. Most recently, Cisco and GE Industrial Systems established GE Cisco Industrial Networks to develop Internet-based products for factory-to-office communications in small- and medium-sized businesses.

All of Chambers' hard work has not gone unnoticed in the media. In September 1999, ABC's "20/20" newsmagazine program profiled Chambers as "The Best Boss In America." In the same year, Chambers and Cisco also earned honors from *BusinessWeek* (one of the top 25 executives in the world), *Worth Magazine* (No. 2 CEO in America), and *Fortune* (the third-best company to work for in America).

Craig Barrett
President and CEO, Intel

Quick Tips

You can replace the default sounds in AIM (AOL Instant Messenger) with your own custom sounds. To change the default sounds, select MyAIM from the pull-down menu, highlight Edit Options, and click Edit Preferences. Click the Sound tab. AIM will display a list of actions and their associated sounds. To change the default sound, click the Browse button next to the action you want associated with a new sound. Browse your system for the sound you want and click Open. You can click the Preview button to listen to the new sound.

Dr. Michael Cowpland

Former chairman, president and CEO, Corel

Whenever a well-known CEO resigns, opinions and speculation flood the computer technology world. This was especially true when Corel chairman, president and CEO Dr. Michael Cowpland resigned earlier this year.

As the company founder, Cowpland shaped Corel into a billion-dollar company that specialized in business productivity, graphics, and operating system applications, such as WordPerfect and the Corel Linux operating system.

However, during the past few years, Cowpland was criticized in the press for living an extravagant lifestyle while Corel shares plummeted 36 cents per share and the company posted a second quarter 2000 net loss of $23.6 million. For comparison, at the end of the second quarter 1999, the company had produced a net profit of $9.2 million. However, those profits paled in comparison to the profits Corel garnered in the mid-1990s; Corel produced a net profit of $32.5 million in 1994.

Cowpland resigned in August 2000, and Derek J. Burney, who previously served as Corel's vice president and engineering and chief technology officer, took the helm as interim CEO and president. Although Cowpland will remain part of the Corel team as a technology advisor and director, he is no longer directly involved in company operations.

Prior to Cowpland's departure, the company released plans to cut $40 million in annual expenses. Since then, Corel estimated 139 jobs would be cut while consolidating

Gates vs. Ellison: King Of The Mountain

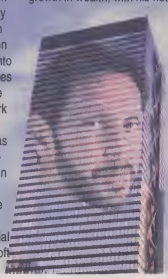
It's difficult to pick up any publication about computer technology and not read something about Microsoft or Oracle. These two powerhouses sport surging stocks and software products that result in billions of dollars of revenues. At the helm of these companies you'll find two competitive leaders, Bill Gates and Larry Ellison, respectively. Both of these visionaries founded their own software companies in the 1970s, employed the best people to build billion-dollar dynasties, and became self-made billionaires.

Gates and Ellison made a lot of headlines this year as they competed for the title of Forbes' "World's Richest Person." For the past seven years, the title belonged to Bill Gates, but with the struggle between Microsoft and the U.S. Department of Justice, Microsoft stock fell enough this year to give Ellison hope for the title. In April, Ellison was a mere $2 billion in net worth behind Gates. (Net worth includes the amount of company shares each person owns. Both Ellison and Gates hold millions of shares in each of their companies.)

Ellison has been very vocal about his intentions of seizing the world's richest person title and of his personal competition with Gates. It is not uncommon for Ellison and Gates to openly criticized each other's ideas in the press. For example, Ellison supports breaking Microsoft into separate companies, and Gates has been less than supportive of Ellison's latest $199 network computer that is meant to replace the desktop PC. But as with any competition, the contestants can get out of hand. In June 2000, Ellison confirmed that Oracle hired the detective firm IGI to spy on Microsoft. Oracle hired IGI to find financial relationships between Microsoft and pro-Microsoft lobbying groups.

By the time the spying activities were uncovered, the $2 billion net worth gap between Ellison and Gates had widened considerably. In *Forbes*' recent listing of the World's Richest People, Gates' net worth was listed as $60 billion and Ellison's as $47 billion, making them the first- and second-richest people in the world. However, Ellison was recognized for having the largest growth in wealth, with his net worth climbing from $9.5 billion in 1999 to $47 billion in 2000.

The competition between these two will definitely be something to watch in the coming year. With the launch of Ellison's new network computer company and the antitrust suit facing Microsoft, the title for World's Richest Person could be up for grabs again. ■



Shawn Fanning
Co-founder, Napster Inc.

engineering operations in Dublin, Ireland to corporate headquarters in Ottawa.

John Doerr & Vinod Khosla

Venture capitalists, Kleiner Perkins Caufield & Byers

Industry analysts consider John Doerr and Vinod Khosla, partners in the venture capitalist firm Kleiner Perkins Caufield & Byers, experts in the technology industry. Working out of Silicon Valley, these venture capitalists have supported initial backing for companies such as Amazon.com, Excite, and Netscape Communications.

Before launching his career as a venture capitalist, John Doerr invented computer memory devices, worked as an engineer for Intel, and was the CEO of Silicon Compilers. His venture capitalist peers consider Doerr to be one of the most powerful people in the multimedia industry. Besides analyzing new dot-com companies as potential investments, Doerr serves on the board of directors of such successful companies as Sun Microsystems, Macromedia, and Intuit. Doerr's business and entrepreneurial skills have translated into a gift for recognizing worthwhile investments. Since Doerr joined Kleiner Perkins Caufield & Byers in 1980, company investments include $1.3 billion in 250 American technology companies.

Vinod Khosla also had established a career in the technology industry before joining Kleiner Perkins Caufield & Byers. Khosla founded Daisy Systems and was one of the founders of Sun Microsystems. Now, Khosla turns million-dollar investments into billion-dollar investments. He joined the venture capitalist firm in 1986 and backed the startup company Cerent, which networking hardware giant Cisco purchased for $6.9 billion.

Shawn Fanning

Co-founder, Napster Inc.

Just a few years ago, Shawn Fanning was a freshman at Northeastern University in Boston; now, the industry considers Fanning a renowned software developer. Fanning dropped out of college to create the controversial Napster application. Now, instead of switching majors or racking up student loans, Fanning battles the RIAA (Recording Industry Association of America), record companies, and recording artists who are suing him for copyright infringement.

Bored with upper-level courses at Northeastern, Fanning developed a downloadable music application that allows users to log into a music community and swap MP3 (MPEG [Moving Pictures Experts Group] Audio Layer 3) files. Napster creates a personal library of the MP3 files that is saved on a user's hard drive. When the user logs into the Napster Web site, he or she can see and explore other Napster users' music libraries on their hard drives and then download those MP3 files. Because users download the files from other computers, each PC performs as an individual server, and none of the files is stored on the Napster servers. However, the RIAA believes Napster infringes on copyright laws just by supplying the means for users to share MP3 files. In the summer, Napster won a federal reprieve from an injunction that would have shut down the site, but that injunction could be reinstated this fall.

Since Napster first appeared in beta version in June 1999, millions of people have downloaded and registered the free program. Even with its instant popularity, Napster has yet to turn a profit. However, some technology companies, such as Intel, recognize Fanning's idea of peer-to-peer computing using the Internet as an innovative idea that could change the computer industry.

Carly S. Fiorina

President and CEO, Hewlett-Packard

The first year as president and CEO of Hewlett-Packard has been eventful for Carly Fiorina. Following a long career at AT&T and Lucent Technologies, Fiorina became the first woman to lead a Dow 30 company (the Dow 30 represents the top 30 blue-chip stocks traded on the New York Stock Exchange). She also was the first top executive at HP recruited from an outside source, and HP appears to be thriving under her leadership. HP's 2000 third-quarter (which ended July 31, 2000) earnings statement showed $11.8 billion in net revenues and an EPS (earnings per share) of 97 cents. A year ago, the company posted $10.3 billion in net revenues and an EPS of 71 cents.

HP chose Fiorina as president and CEO after the retirement of Lew Platt, a company veteran who became CEO in 1992. Although Fiorina is new to HP, she was very successful at AT&T. She led a multimillion-dollar marketing campaign for Lucent, and the company promoted her to president just two years after the company was launched.

When Fiorina became HP's president and CEO, HP was successfully churning out PCs and printers, but quarterly growth was minimal. Under Fiorina's guidance, the company launched a multimillion-dollar marketing campaign, Internet services, and reorganized into four separate organizations to handle consumer and corporate sales and computer and printer/imaging products. Now, third quarter

"The grass may be greener in Silicon Valley, but that's mainly due to the shredded dollar bills used for mulch there."

Dates To Remember

In September 1997, five information technology professionals founded a membership organization called "Round Zero" for industry professionals in various companies to gather and discuss the trends of the day. The group has grown and continues to meet every month for a $50-a-plate dinner.

results reveal amazing growth in various product arenas. PhotoSmart camera and printer revenues grew 329%, home PC revenues grew 62%, notebook computer revenues grew 93%, and multifunction device revenues grew 77%.

Mary Meeker

Managing director and analyst, Morgan Stanley Dean Witter

Following a wave of successful business analysis, backings, and predictions for companies such as Amazon.com, Yahoo!, eBay, America Online, and Priceline.com, Mary Meeker has become a star in computer technology analyst and investment circles. Meeker gained so much recognition from the industry, that this year she was ranked third in *Fortune* magazine's "50 Most Powerful Women in America."

Meeker joined Morgan Stanley Dean Witter as a PC software/hardware and new media analyst in 1991. Previously, she served as a technology research analyst at the investment banking firm Cowen and Salomon Brothers. Within a few years at Morgan Stanley Dean Witter, Meeker recognized the profits Internet companies could offer and recommended America Online, Netscape Communications, Intuit, and Expedia to potential investors. During that time, Meeker also produced trend analysis and e-commerce studies that served as handy guides for investors.

Analysts typically research companies, develop a financial analysis, and if the company looks promising, may market the company to potential investors. Following the investments, the analyst continues to develop financial analyses and closely watches the company stock and provides reports. As one of the leading Internet analysts, Meeker pays close attention to new Internet trends and potential investments while keeping an eye on existing success stories, such as eBay and Excite@Home. Meeker also delivers blunt company analyses. In June 2000, Meeker and other analysts voiced concern that Amazon.com may not meet second- and third-quarter estimates; the stock fell 22%.

Henry Blodget

First vice president and senior Internet/electronic commerce analyst, Merrill Lynch

Before his career at Merrill Lynch, Blodget predicted Amazon.com's stock would soar. Few analysts believed his prophecy, but less than a month later, Amazon.com rose to $400 per share. Within a few months, Merrill Lynch offered Blodget a job as first vice president and senior Internet/electronic commerce analyst. Today, you can find Blodget's analysis and recommendations in numerous stock market and business publications.

Prior to becoming a respected Internet analyst, Blodget worked as a freelance journalist and as managing director and senior Internet analyst at the investment bank CIBC Oppenheimer. Like Mary Meeker, Blodget recognized the potential of Internet technology businesses early on. Some of his most notable recommendations include eToys, Barnesandnoble.com, Pets.com, and RealNetworks. Consequently, investors pay close attention to Blodget's recommendations, especially when the advice concerns dot-com stock.

Blodget specializes in discovering quality companies for long-term investments. Even with the unpredictability of Internet stocks, Blodget recommended a few companies that were worth long-term investments, such as America Online, Inktomi and Yahoo!. Blodget also predicted the merger of America Online and Time Warner would be successful and result in phenomenal profits.

Joseph Park and Yong Kang

Co-founders, Kozmo.com

Joseph Park and Yong Kang are online shopping innovators. This talented pair started Kozmo.com in 1997, creating one of the first delivery companies to accept Internet orders for food, video games, movie rentals, electronics and books. Kozmo promises to deliver the items ordered in less than an hour (provided you live in designated delivery areas). Since its inception, the company has raised more than $250 million in capital and boasts hundreds of thousands of customers.

In building the company, Park recruited managers from such companies as FedEx, Wal-Mart, and Gap, and concentrated on constructing a customer base. As a result, the company developed nationwide. Just this year, Kozmo expanded its New York headquarters and opened services in Atlanta; Portland, Ore.; Washington, D.C.; Los Angeles; and Chicago. After these massive expansions and a few labor cuts, Park and Kang stepped down and turned the company over to Gerry Burdo as president and acting CEO. Park, who formerly served as CEO, will continue to serve as chairman of the board. RS

by Buffy Cranford-Petelle

Carly S. Fiorina
President and CEO, Hewlett-Packard

Get Rich Click

Millionaires, billionaires . . . after a point, the mind can no longer grasp the wealth of some of the computer and Internet industries' top names. Luckily, many of them are giving generously to charities. Read on to see who's who and how much "who" has in the high-tech world, along with a snapshot of a typical Internet startup and a revealing look at venture capitalists.

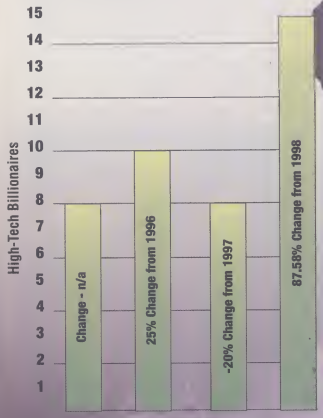
Top 5 Richest Americans:

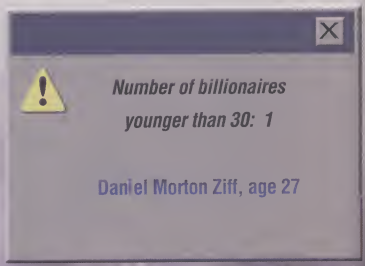
Three of the top five richest Americans in 2000 hail from the computer industry; in fact, two of the top four hail from Microsoft. Although very impressive, Bill Gates' and Larry Ellison's relative ranks could fluctuate with the stock prices of their respective companies. (*NOTE: the next Forbes 400 list of the world's richest people should arrive in October 2000.*)

Source: Forbes.com "The World's Richest People: Top Five" (July 2000)

Computer Industry Billionaires In *Forbes*' Top 100

After a slight dip in 1998, we saw a surge of new high-tech billionaires in 1999.





Source: Forbes' Top 100 Richest People in America (Oct. 1999)

Highest Compensated Women In Silicon Valley's Publicly Held Companies, 1999

There's still a wide gulf between the sexes at the top end of the pay scale. Although HP's Carleton Fiorina cracked the overall Top 5 (below), her $69 million was "only" about half of John T. Chamber's 1999 haul. And although Kathy Levinson's pay package ranked second among women, it was only 23rd overall. These are total compensation figures, which include salary, bonuses, commissions, the dollar value of restricted stock awards, the exercise of stock options, and other compensation.

Carleton S. Fiorina, CEO - $69.4 million

Kathy Levinson, president (retired May 2000) - $16.7 million

Elizabeth H. Davila, president - $14.2 million

Ellen M. Hancock, president - $10.2 million

Sandra Vaughan, vice president - $7.3 million

20% of the top 25 executives' salaries in Silicon Valley go to former CEOs and executive vice presidents.

Source: Mercury Center (June 2000)

Highest Compensated Executives In Silicon Valley's Publicly Held Companies, 1999

Oh, to be a Silicon Valley executive. It pays to be a top exec at Cisco, Yahoo!, and Hewlett-Packard. Find out how much here. Again,these figures include salary, bonuses, commissions, the dollar value of restricted stock awards, the exercise of stock options, as well as other compensation.

Compiled by Marty Sems
Graphics & Design
By Bret Jurgens & Ginger Riley

John T. Chambers CEO $121.7 million

Cisco

Gary Valenzuela, CFO (retired July 2000) $101.2 million

Jeffrey Mallett, president, COO $103.7 million

Yahoo!

Yahoo!

Carleton S. Fiorina, CEO $69.4 million

HP

Yahoo!

Anil Singh, Sr. VP $74.6 million

Source: Mercury Center (June 2000)

Gates Foundations' Assets & Donations

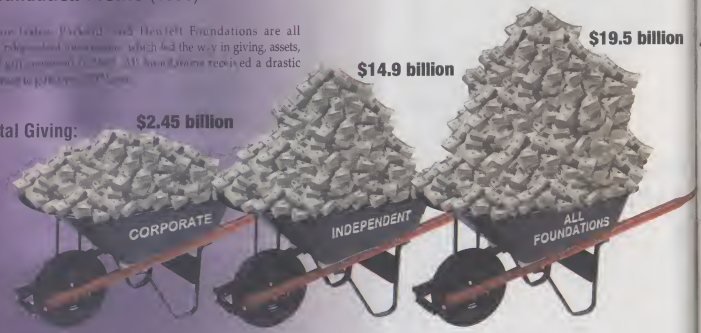
Bill Gates and his wife, Melinda, have rapidly outpaced most, if not all, other charitable foundations in the world. Regardless of your view of the controversial software tycoon, there's no disputing his generosity.

Approximate Assets:	$21 billion
Approximate Donations Paid Out To Date:	$976 million

SOURCE: BILL AND MELINDA GATES FOUNDATION (AUGUST 2000)

Foundation Profile (1998)

The Gates, Packard and Hewlett Foundations are all [illegible] which led the way in giving, assets, and [illegible]. All foundations received a drastic [illegible]



Total Assets:	$13.1 billion	$327 billion	$385 billion
Gifts Received:	$2.65 billion	$16.3 billion	$22.6 billion

[illegible] EDITION

More than 40% of surveyed households with $5 million or more in net worth exercised stock options in the past year.

[illegible] GROUP, "1999 PENTAMILLIONAIRE RESEARCH PROGRAM: A PORTRAIT OF THE ULTRA HIGH NET WORTH MARKET" (FEB. 2000)

Computer Industry Philanthropists

The most recent figures available from The Foundation Center give an indication of how quickly the Gates Foundation has grown. However, Gates is a relative newcomer when it comes to giving because the foundations started by the founders of Hewlett-Packard have been giving to charities for decades. (*NOTE: Rank is in relation to all foundations.*)

Total Giving
Assets

David and Lucile Packard Foundation

$264 Million - *Ranked 4th*

$9.58 Billion - *Ranked 3rd*

(as of 12/31/98)

Bill and Melinda Gates Foundation

$113 Million - *Ranked 14th*

$5.37 Billion - *Ranked 7th*

(as of 3/31/99-see the more recent figures from the Gates Foundation on the previous page)

William and Flora Hewlett Foundation

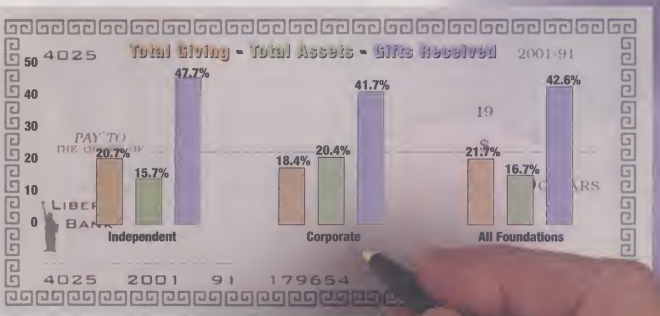
$85.4 Million - *Ranked 19th*

$1.94 Billion - *Ranked 23rd*

(as of 12/31/98)

THE FOUNDATION CENTER, "TOP U.S. FOUNDATIONS" (JUNE 2000)

Foundation Profile Increases From 1997 To 1998



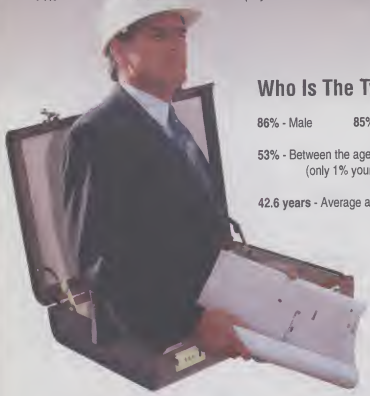
THE FOUNDATION CENTER, "HIGHLIGHTS OF THE FOUNDATION YEARBOOK 2000 EDITION"

What Is A Typical Internet Startup Company?

D

16.8 months	Average age of company
20%	Startups doing Web development/services
41%	Startups showing a profit in 1999
25%	Startups funded partly by venture capital
35%	Hope to be bought out by another company (24% plan to go public while 33% don't have a firm exit strategy)
74%	Hire via friends' and employees' recommendations

SOURCE: "STATE OF THE STARTUP," JUNE 2000, BY IDG RESEARCH SERVICES FOR THE STANDARD



Who Is The Typical Startup Founder?

86% - Male **85%** - White

53% - Between the ages of 35 and 49 (only 1% younger than 25)

42.6 years - Average age

50% - Have post-graduate study or degree

64.4 hours - Average workweek

65% - Say their long workweeks leave them with less time than they would like but it's manageable

SOURCE: "STATE OF THE STARTUP," JUNE 2000, BY IDG RESEARCH SERVICES FOR THE STANDARD

The Halo Effect: Internet Startups By City

Not every dot-com pops up around Seattle or Silicon Valley. New York, San Francisco, and Los Angeles all claim a bigger share of the startup scene.

New York City	9%
San Francisco	9%
Los Angeles	9%
Silicon Valley	6%
Seattle	4%

SOURCE: "STATE OF THE STARTUP," JUNE 2000, BY IDG RESEARCH SERVICES FOR THE STANDARD

Venture Capitalists Are Absent-Minded About Their Own Debts

We couldn't pass this one up. VC (venture capital) companies have been lauded as innovators for funding unproved Internet startups and vilified for the same reason. MoneyUnion decided to see how VCs handled their own personal finances.

$11,934	Average amount venture capitalists who were polled charge monthly
61%	Pay the monthly minimum on their credit cards *(compared to 51% of lawyers and 43% of doctors)*
48%	Reported that their credit card debt is presently their highest ever *(compared to 37% of CEOs, 17% of doctors, and 13% of lawyers)*
38%	Charged their most recent major purchase while depressed *(compared to 8% of CEOs)*
17%	Know the highest interest rate on their credit card *(compared to 51% of CEOs, 39% of doctors, and 34% of lawyers)*

In addition, VCs are six times more likely to know the debt status of a client company than their own debt and are four times more likely than lawyers to make late payments.

SOURCE: MONEYUNION INC. (SURVEY OF 317 VENTURE CAPITALISTS, JUNE 2000)

College Students & Their High-Tech Expectations

Ernst & Young surveyed 700 to 800 college students at its LLP International Intern Leadership Conference (August 2000). Some of the students' answers revealed a lot about how they expect high-tech to affect their futures.

91% use the Internet every day

63% expect to retire in their 40s or 50s

6% want to become a dot-com billionaire

100 Top PC Executives

The Leaders Of The Computer World's Leading Companies

The computer technology industry continually evolves as companies build on the unprecedented growth and sales performance the industry has enjoyed so far, merge with other technology companies, and deliver new, innovative products. We've compiled a list of the top executives of 100 significant computer technology companies and of 25 noteworthy Internet companies that are relatively new to the technology scene. We selected the companies represented here based on revenues, number of employees, and industry contribution in terms of products, ideas, or new technologies. The public and private companies represented in this list produce computer hardware and software, consumer electronics, networking equipment or services, e-commerce Web sites, and more.

Whether you want to familiarize yourself with top executives in the computer technology industry or find the hottest Internet companies to watch, this listing is a great place to start. Companies are listed in alphabetical order, and if executives hold multiple positions, the dates reflect the latest position obtained. RS

by Buffy Cranford-Petelle

3Com
CEO/Chairperson: Eric A. Benhamou, 1994
Years with company: 13
Previous experience: Vice President of Engineering, Bridge Electronics

3dfx Interactive
CEO/President: Dr. Alex Leupp, 1999
Years with company: 1
Previous experience: President and CEO, Chip Express

Acer America
President/COO: Max Wu
Years with company: n/a
Previous experience: n/a

Adaptec
CEO/President: Bob Stephens, 1999
Years with company: 5
Previous experience: Founder and Chief Executive Officer, Power I/O

Adobe Systems
CEO/Co-Chairperson: Dr. John E. Warnock, 1982
Years with company: 18
Previous experience: Co-founder

Advanced Micro Devices (AMD)
CEO/Chairperson: W. J. Sanders, 1969
Years with company: 31
Previous experience: Co-founder

Advent Software
CEO/President: Peter Caswell, 1999
Years with company: 6
Previous experience: President, Advent Software

Amazon.com
CEO: Jeff Bezos, 1994
Years with company: 6
Previous experience: Founder, Amazon; Senior Vice President, D.E. Shaw & Co.

America Online
CEO/Chairperson: Stephen M. Case, 1985
Years with company: 15
Previous experience: Co-founder

Apple
CEO: Steven Paul Jobs, 1977
Years with company: 23
Previous experience: Co-founder

*Dates indicate when individuals assumed their current company positions

BroadVision
Chairperson/Pres.: Dr. Pehong Chen, 1993
Years with company: 7
Previous experience: Vice President of Multimedia Technology, Sybase

Canon USA
CEO/President: Kinya Uchida, 1999
Years with company: 37
Previous experience: President, Canon France S.A.

Casio Computer Company
Chairperson: Toshio Kashio
Years with company: n/a
Previous experience: n/a

Cisco Systems
CEO/President: John T. Chambers, 1995
Years with company: 9
Previous experience: Sr. Vice President, Worldwide Sales and Operations, Cisco

Compaq
CEO/President: Michael D. Capellas, 1999
Years with company: 2
Previous experience: Chief Information Officer, Compaq

Computer Associates
CEO/President: Sanjay Kumar, 1994
Years with company: 13
Previous experience: Director Software Development, CA

Conexant
CEO/Chairperson: Dwight Decker, 1999
Years with company: 11
Previous experience: Senior Vice President, Rockwell; President Rockwell Semiconductor Systems

Creative Technology
CEO/Chairperson: Sim Wong Hoo, 1981
Years with company: 19
Previous experience: Founder

Datalink
CEO/President: Greg R. Meland, 1993
Years with company: 9
Previous experience: North Central U.S. Director of Sales, Control Data

Michael Dell, CEO/ Chairperson, Dell

"The Internet is much more than just sales and online sales, although that seems to be something that people get attracted to as a headline. One of the real values of the Internet is that we've been able to use the support information that we gather from our customers. Our business is centered around these direct relationships with our users. And the fact that we deal directly with our customers means that we have perfect information about what they want to buy."

SOURCE: JUNE 8, 2000, ADDRESS AT THE NATIONAL PRESS CLUB

Dell
CEO/Chairperson: Michael Dell, 1984
Years with company: 16
Previous experience: Founder

ebay
CEO/President: Meg Whitman, 1998
Years with company: 2
Previous experience: General Manager, Hasbro's Preschool Division

EarthLink Network
CEO: Garry Betty, 1994
Years with company: 6
Previous experience: President and CEO, Digital Communications Associates

Eastman Kodak
Chairperson: George M.C. Fisher, 1994
Years with company: 6
Previous experience: CEO, Motorola

Eidos
Chairperson: Ian Livingstone
Years with company: n/a
Previous experience: n/a

Electronic Arts
CEO/Chairperson: Lawrence F. Probst, III, 1991
Years with company: 16
Previous experience:
National Sales Manager, Activision

@Machines
CEO/President: Stephen A. Dukker, 1998
Years with company: 2
Previous experience: Senior Vice President of Merchandising, Computer City

Epson America
CEO/President: Norio Niwa, 1992
Years with company: 27
Previous experience: Seiko Epson

Ericsson
CEO/Chairperson: Dr. Lars Ramqvist, 199
Years with company: 19
Previous experience: President and CEO, Eri

Excite@Home
Outgoing CEO/Chairperson/Pres.: George Bell, 2000
Years with company: 4
Previous experience: Senior Vice President of Times Mirror Magazines

Exodus Communications
CEO/Chairperson: Ellen M. Hancock, 1998
Years with company: 2
Previous experience: Senior Vice President, IBM

Fujitsu Limited
President: Naoyuki Akikusa, 1998
Years with company: 29
Previous experience: President, China Project Promotion Group, Fujitsu

Gateway
Chairperson: Ted Waitt, 1985
Years with company: 15
Previous experience: Co-founder

Google
CEO: Larry Page, 1998
Years with company: 2
Previous experience: Software designer, Advanced Management Systems

Guillemot
CEO/President: Claude Guillemot, 1984
Years with company: 16
Previous experience: Co-founder

Handspring
Chairperson/Chief Production Officer: Jeffrey C. Hawkins, 1998
Years with company: 2
Previous experience: Founder, Palm Computing

Hasbro
CEO/Chairperson: Alan G. Hassenfeld, 19
Years with company: 30
Previous experience: President, Hasbro

Hewlett-Packard
CEO/President: Carleton (Carly) S. Fiorina, 1999
Years with company: 1
Previous experience: 20 years at AT&T and Lucent

IMAGE COURTESY OF HP

Hitachi
President: Etsuhiko Shoyama, 1999
Years with company: 41
Previous experience: Executive Vice President and Representative Director, Hitachi

IBM
CEO/Chairperson: Louis V. Gerstner Jr., 1993
Years with company: 7
Previous experience: Chairman and CEO, RJR Nabisco

Imation
CEO/Chairperson/Pres.: William T. Monahan, 19
Years with company: 4
Previous experience: Group Vice President, Electro and Communications Systems Group, 3

InfoSpace
CEO: Arun Sarin, 2000
Years with company: 1
vious experience: CEO (U.S. and Pacific) Vodafone AirTouch

Image courtesy of Intel

Intel
CEO/President: Craig R. Barrett, 1998
Years with company: 26
Previous experience: Chief Operating Officer, Intel

Intergraph
CEO: James F. Taylor Jr., 2000
Years with company: 24
Previous experience: Co-founder

Interplay Productions
CEO/Chairperson: Brian Fargo, 1983
Years with company: 17
Previous experience: Founder

Intuit
O/President: Stephen M. Bennett, 2000
Years with company: 1
Previous experience: GE

Iomega
CEO/President: Bruce Albertson, 2000
Years with company: 1
Previous experience: Vice President, Worldwide Marketing and Product Management, GE Appliances and Corporate Officer of GE

Lernout & Hauspie
Chairperson: Gaston Bastiaens, 1996
Years with company: 4
Previous experience: President and CEO, Quarterdeck

Lexis-Nexis
Nexis CEO/President: Lou Andreozzi, 2000
Years with company: 1
Previous Experience: President/CEO, Mariindale-Hubbell

Lexis-Nexis
exis CEO/President: Bill Pardue, 2000
Years with company: 3
vious experience: Director of Marketing, *The Washington Post*

Craig R. Barrett, CEO/President, Intel

"To improve the return on America's educational technology investment, we must provide teachers with the skills necessary to integrate technology effectively into the curriculum. We need to use technology to connect schools, families, and the community and provide resources for schools to use technology more effectively."

SOURCE: JUNE 27, 2000, SPEECH AT NATIONAL EDUCATIONAL COMPUTING CONFERENCE

Lexmark International
CEO/Chairperson: Paul J. Curlander, 1998
Years with company: 9
Previous experience: Director of Printer Products, IBM

Logitech
EO/President: Guerrino De Luca, 1998
Years with company: 2
Previous experience: Executive Vice resident of Worldwide Marketing, Apple

Lucent Technologies
CEO/Chairperson: Richard A. McGinn, 1995
Years with company: 5
Previous experience: CEO, Network Systems

Macromedia
CEO/Chairperson: Rob Burgess, 1996
Years with company: 4
Previous experience: President and CEO, Alias Research

Matrox Electronic Systems
President: Lorne Trottier, 1976
Years with company: 24
Previous experience: Engineer

Maxtor
CEO/President: Mike Cannon, 1996
Years with company: 4
Previous experience: Senior Management Storage Systems Division, IBM

Micron Electronics
CEO/Chairperson/President: Joel Kocher, 1997
Years with company: 3
Previous experience: President and Chief Operating Officer, Power Computing

Bill Gates, Chairman and co-founder, Microsoft

"An increase in employment and a lack of inflation over these last five or six years have finally forced economists to admit that there's something coming in that's actually changing the rules of the game, changing those typical trade-offs, and that change is the presence of technology."

SOURCE: SEPTEMBER 11, 2000, SPEECH IN SYDNEY, AUSTRALIA

Microsoft
Chairman: Bill Gates, 1975
Years with company: 25
Previous experience: Co-founder

Mitsubishi Electric (MELA)
CEO/Chairperson: Kiyoshi Kawakami, 1999
Years with company: 34
Previous experience: Manager and General Manager of the Overseas Marketing Division, Industrial and Factory Automations Systems Group

Motorola
CEO/Chairperson: Christopher B. Galvin, 1999
Years with company: 27
Previous experience: Board of Directors, Motorola

National Semiconductor
CEO/Chairperson/President: Brian L. Halla, 1996
Years with company: 4
Previous experience: Executive Vice President of LSI Logic Corporation

NEC Computers
CEO/President: Michel Fromont, 2000
Years with company: 6
Previous experience: Vice President Marketing and Sales, Tandon

NetCreations
CEO/Chairperson/Treasurer: Rosalind Resnick, 1995
Years with company: 5
Previous experience: Creator, America Online's NetGirl Forum, Business journalist at *The Miami Herald*

Network Associates
CEO/Chairperson: William L. Larson, 1997
Years with company: 7
Previous experience: Vice President of Sales and Marketing, Sun Microsystems

Nokia
CEO/Chairperson: Jorma Jaakko Ollila, 1999
Years with company: 15
Previous experience: President and CEO, Nokia

Nortel Networks
CEO/President/VC: John Roth, 1995
Years with company: 31
Previous experience: President of North American Operations, Nortel

Novell
CEO/Chairperson: Dr. Eric Schmidt, 1997
Years with company: 3
Previous experience: Chief Technology Officer and CEO, Sun Microsystems

NVIDIA
CEO/President: Jen-Hsun Huang, 1999
Years with company: 7
Previous experience: Director of Coreware, LSI Logic

Okidata—Oki Electric Industry
CEO/Chairperson: Dennis P. Flanagan, 1999
Years with company: 15
Previous experience: Vice President, Memorex

Oracle
)Chairperson: Lawrence J. Ellison, 1977
Years with company: 23
Previous experience: Founder

Palm
CEO: Carl Yankowski, 1999
Years with company: 1
Previous experience: CEO of The Reebok Brand

Panasonic
(Matsushita Electric Corp. of America)
CEO/Chairperson: Hideaki "Don" Iwatani, 2000
Years with company: 32
Previous experience: President, Panasonic Consumer Electronics

PeopleSoft
CEO/President: Craig A. Conway, 1999
Years with company: 1
Previous experience: President/CEO, OneTouch Systems

Philips Electronics
(Royal Philips Electronics)
CEO/President: Cor Boonstra, 1996
Years with company: n/a
ious experience: President/COO, Sara Lee

Polaroid
CEO/Chairperson: Gary T. DiCamillo, 1995
Years with company: 5
Previous experience: Group Vice President, Black & Decker Corp.

Priceline.com
Chairperson: Richard S. Braddock, 1998
Years with company: 2
Previous experience:
Chairman of True North Communications

Psion PLC
Chairperson: David E. Potter, 1980
Years with company: 20
Previous experience: Founder

Qualcomm
/Chairperson: Dr. Irwin Mark Jacobs, 1985
Years with company: 15
evious experience: Founder of LINKABIT

Quantum
CEO/Chairperson/Acting President, DLT & Storage Systems Group: Michael A. Brown, 1995
Years with company: 16
Previous experience: President Desktop Products Group, Quantum

RealNetworks
CEO/Chairperson/Treasurer: Rob Glaser, 1995
Years with company: 5
Previous experience: Vice President of Multimedia and Consumer Systems, Microsoft

Red Hat
Chairperson: Robert P. Young, 1994
Years with company: 6
Previous experience: Developed and sold Vernon Computer Rentals

RSA Security
CEO/President: Arthur W. Coviello, 1995
Years with company: 5
Previous experience: COO, CrossComm

S3
CEO/Chairperson/President: Ken Potashner, 1998
Years with company: 2
Previous experience: President, CEO and Chairman, Maxwell Technologies

Samsung Electronics America
CEO/President: Bo-Soon Song, 1999
Years with company: 20
Previous experience: Finance Director of Samsung Electronics

SAP
Co-CEO/Co-Chairperson: Hasso Plattner, 1972
Years with company: 28
Previous experience: Co-founder

Seagate Technology
CEO/Chairperson: Stephen J. Luzzo, 1998
Years with company: 7
Previous experience: Co-head of Bear Stearns' Global Technology Group

Sharp Electronics
President: O. Perry Clay, 1998
Years with company: 16
Previous experience:
Senior Executive Vice President

Silicon Graphics (SGI)
CEO/Chairperson: Robert Bishop, 1986
Years with company: 14
Previous experience:
Senior Executive Apollo Computer

Mark Cranitch/© SILICON GRAPHICS

Siebel Systems
CEO/Chairperson: Thomas M. Siebel, 1993
Years with company: 7
Previous experience: Chief Executive Officer of Gain Technology

Sony Electronics
CEO/Chairperson: Fujio Nishida, 2000
Years with company: 28
Previous experience: Established the first Sony branch office in Morocco

Sun Microsystems
CEO/Chairperson: Scott McNealy, 1984
Years with company: 16
Previous experience: Co-founder

Symantec
CEO/Chairperson/President: John Thompson, 1999
Years with company: 1
Previous experience:
General Manager of IBM Americas

Texas Instruments
CEO/Chairperson: Tom Engibous, 199
Years with company: 24
Previous experience: President of the Semiconductor Group, Texas Instrument

Toshiba America Information Systems
Executive Vice President: Joe Formichelli, 1998
Years with company: 2
Previous experience: General Manager, IBM

Transmeta
CEO: David Ditzel, 1995
Years with company: 5
Previous experience: Chief Technical Officer, Sun Microsystems Microelectronics Division

VERITAS Software
CEO/Chairperson/President: Mark Leslie, 1999
Years with company: 12
Previous experience: Principal and Owner of Leslie Consulting

Western Digital
CEO/President: Matthew Massengill, 20
Years with company: 15
Previous experience: Research Engineer, A Aerospace and Communications

Xerox
CEO/Chairperson: Paul A. Allaire, 2000
Years with company: 34
Previous experience: Xerox executive

Xircom
CEO/Chairperson/President: Dirk I. Gates, 1995
Years with company: 12
Previous experience: Co-founder

Yahoo!
CEO/Chairperson: Tim Koogle, 1995
Years with company: 5
Previous experience: Motorola executive

Yamaha
Senior managing Director and Representative Direc
Shuji Ito, 2000 - Years with company: 35
Previous experience: Senior Managing Director, Ya

25 Top Internet Executives

Major Players From .com & Beyond

The world is still learning the ropes of conducting business on the Internet, but Internet companies have already flooded technology hot spots from California's Silicon Valley to New York's Silicon Alley and many points in between. Although some big name players such as Amazon.com and Yahoo! made mainstream headlines with stock prices that soared and then fell on hard times, many young Internet companies, and the executives behind them, are also worth knowing about.

The 25 Internet executives listed here represent public and private Internet companies that have succeeded in their sectors with increased revenues and hundreds of thousands, sometimes millions, of daily Web site hits. You'll find executives representing auction, greeting card, stock market, and coupon Internet sites, as well as some of more controversial sites such as those in the digital music market.

The executives on these pages represent companies that have produced new and innovative ideas, although rarely substantial profits. Some companies, such as Napster, have made Internet history, while others such as Pets.com have delivered creative marketing campaigns and watched sales increase by millions of dollars. The companies represented here are the best bets to become the market leaders, but with daily mergers and buy-outs reshaping the dot-com scene, 25 new faces may grace this section next time. RS

About.com
CEO/Chairperson: Scott P. Kurnit, 1996
Years with company: 4
Previous experience: CEO/President MCI/News

AtomFilms
CEO: Mika Salmi, 1998
Years with company: 2
Previous experience: Business Development, RealNetworks

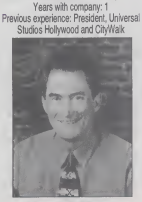
Buy.com
CEO/Director: Gregory J. Hawkins, 1999
Years with company: 1
Previous experience: Senior Vice President, Global Sales, Ingram Micro

CarsDirect.com
CEO/President: Robert N. Brisco, 1999
Years with company: 1
Previous experience: President, Universal Studios Hollywood and CityWalk

CDNOW
CEO/President: Jason Olim, 1994
Years with company: 5
Previous experience: Co-founder

CoolSavings
CEO/Chairperson/President: Steven M. Golden, 1996
Years with company: 5
Previous experience: Financial consultant, Smith Barney

Egghead.com
CEO/President: Jeffery F. Sheahan, 1999
Years with company: 1
Previous experience: COO, Onsale



eGreetings Network
CEO/President: Gordon M. Tucker
Years with company: n/a
Previous experience: Chairman and CEO, IdeaNet Management

GiftCertificates.com
CEO/Chairperson: Jonas Lee, 1997
Years with company: 3
Previous experience: Management Consultant with Bain & Company

Go2Net
CEO/Chairperson: Russell C. Horowitz, 1996
Years with company: 4
Previous experience: Founder, Xanthus Capital, L.P.

Headhunter.net
CEO/President: Robert Montgomery, 1999
Years with company: n/a
Previous experience: Founder, InterCall

iPrint.com
CEO/Chairperson/President: Royal P. Farros, 1996
Years with company: 4
Previous experience: Chairman, T/Maker Company

iVillage
CEO: Douglas W. (Doug) McCormick, 200
Years with company: 1
Previous experience: President/CEO, Lifet

Loudcloud
CEO: Ben Horowitz, 1999
Years with company: 1
Previous experience: Vice President and General Manager E-commerce Platform division, AOL

Mail.com
CEO/Chairperson: Gerald Gorman, 1997
Years with company: 3
Previous experience: Donaldson, Lufkin, & Jenretty

MarketWatch.com
CEO/Chairperson/President: Larry S. Kramer, 1997
Years with company: 3
Previous experience: Vice President of News, Sports, & Marketing, Data Broadcasting

MoreDirect.com
CEO/Chairperson/President: Russell L. Mock
Years with company: n/a
Previous experience:
20 years in the computer industry

MP3.com
CEO/Chairperson: Michael Robertson, 1997
Years with company: 3
Previous experience: Founder, The Z Company

Napster
CEO/Chairperson: Hank Barry, 2000
Years with company: 1
Previous experience: Joined Napster as part of the Hummer Winblad Venture Partners team.

Pets.com
CEO/Chairperson: Julie L. Wainwright, 1999
Years with company: 1
Previous experience: CEO of Reel.com

PhotoPoint.com
CEO/Chairperson: Ed Bernstein, 2000
Years with company: 1
Previous experience: CEO, Palladium Interactive

Travelocity.com
CEO/President: Terrell B. Jones, 1999
Years with company: 4
Previous experience: President, Sabre Computer Services for American Airlines

uBid.com
CEO/Chairperson/President:
Gregory K. Jones, 1997
Years with company: 3
Previous experience: Senior Vice President of Strategic Markets, APAC TeleServices

VerticalNet
CEO/President: Joseph Galli Jr., 2000
Years with company: 1
Previous experience: CEO/President, Amazon.com

webMethods
CEO/Chairperson/President: Phillip Merrick, 19
Years with company: 4
Previous experience: Vice President of Engineering, Open Software Associate

power this triumphant
now available in a battery
Energizer e²
the battery with
a heart of titanium
Energizer e² TITANIUM
take power to the next level

angel—Early in the 20th century, business angels were wealthy private investors who invested heavily in theater and film productions. The concept is roughly the same today except the term angel is generally used to refer to those who invest in Internet startup companies.

booboo—An employee who has recently graduated from college and has little experience working in a company environment. These individuals bring academic knowledge ("book smarts") and creativity to the firm, but they know little about the company's market, so they often make poor decisions and mistakes regarding product design or promotion.

beltware—The name given to the numerous devices used by technical workers. The devices typically include a Palm Pilot or other PDA (personal digital assistant) that is equipped with contact information or wireless Internet access, a cellular telephone to keep in touch with the office or friends, and a pager. Other devices may include the necessary security cards or keys the individual needs to access server rooms or other secure areas in his or her company. These devices typically remain in plain view and are often carried on the user's belt in various protective cases.

cave dwellers—A term used to describe technical support or question-and-answer employees who work in a confined space. Massive amounts of computers, monitors, and other machines often fill the space in which these people work, thus increasing the heat levels in the office space. To reduce the heat levels, the employees leave the lights off, creating a cavelike environment.

cybercad—Someone who is a cad (a person who doesn't regard another's feelings) online; often used to describe an unscrupulous and duplicitous pursuer of many online romances.

cybercelebrities—People who have become Internet celebrities due to a successful Web site or Internet-based product. These individuals also have made an impact on how people use the Internet. For example, Shawn Fanning created and founded the Napster Web site where users can swap MP3 (MPEG [Moving Picture Experts Group] Audio Layer 3) audio files for free. The site created a legal debate between the music industry, recording artists, and the music-swapping Internet Web sites and made Fanning a cybercelebrity.

cybersquatting—Individuals who register domain names of companies or famous people with the specific intention of selling the domain name later to the company or person for a high price. Some cybersquatters have registered such domain names as whitehouse.com and developed a pornographic site. This is just one method cybersquatters use to encourage the company to purchase the domain name. A bill has been introduced in Congress to make the practice illegal.

cybrarian—A person who specializes in or makes a living by conducting research using the Internet.

digital workplace—A company or business that relies heavily on communicating via e-mail, chat, Web meetings, and online discussion groups to conduct business. This type of environment allows remote employees to stay up-to-date on office activities while on the road or working from home. Software companies have developed digital workplace software that bundles e-mail, chat, and calendaring into a simple package for this purpose.

dot-communist—This term is used in two ways. First, it can refer to someone who believes the Internet shouldn't be used for commercial purposes. Second, it can describe an employee of an Internet company with stock options (worker ownership) who has embraced all the propaganda surrounding the Internet and the New Economy.

dot-com burnout—A condition that commonly occurs among dot-com employees from working too many hours. Individuals in the technology industry work long hours because they face constant competition from other companies. Dot-com burnout is especially prevalent in a company whose goal is to promote a business successfully so it can eventually become public.

dot-com kids—Individuals younger than 30 who have developed a successful Internet business. In some cases, these dot-com kids have become millionaires almost overnight when their company became public, was bought by a larger organization, or skyrocketed in popularity.

egoboo—This term, which is short for ego boost, is the joy of seeing your name online or in print. Many people do this by egosurfing, or putting their names in search engines to find where they may be mentioned. The term originated when people sent opinion letters to science-fiction fanzines to see their name in print. With the Internet, there are hundreds of avenues to get your name online. You can post messages at various chat rooms or publish your own stories on a personal site.

entreprenerd—An entrepreneur who starts a computer or Internet-related business. Bill Gates is an example of an entreprenerd.

five and dime—A term given to the most frequently used telephone area code in the Silicon Valley area (510). Many businesses in the areas of Berkeley, Oakland, and San Francisco use the 510 area code, and some tech workers will use the term to describe traveling to the area, such as "I'm going to the five and dime." It also is referred to as the nickel and dime area code.

freeloaders—People who download free music from the Internet. The word is often used to describe people who download free MP3 files located at the Napster Web site. The music industry considers these people a threat because they often download and share copyrighted music files and the artists and record labels don't get any profit.

hot groups—An assembly of employees who use their creative collaboration skills to work toward a common goal. These groups typically include a collection of intellectual individuals who take it upon themselves to work longer hours on projects.

IAD (Internet Addiction Disorder)—A phenomenon that has been discussed at length but is still hard to quantify. Some researchers have concluded that some people actually become dependant upon the Internet or have an uncontrollable compulsion to be online more than is healthy for their social lives and relationships. Others contend the Internet is just another variety of escapism, such as television, that takes up too much of a person's time and is simply an alternative to dealing with life's rough spots.

Internet saboteurs—Computer hackers who target specific Web sites and render them useless or change their appearance. For example, hackers disrupted the Yahoo! Web site early this year, disabling it for three hours. To avoid Internet saboteurs, many companies have installed security software or firewalls to prevent hackers from altering the site.

ladder bypass—A method of building a career where a person resigns from a lower post in a larger more established company where promotions are hard to get because of the number of people higher up on "the ladder." The person then joins a smaller company to earn the necessary experience and job titles that were so difficult to obtain at the first company. Once the person has climbed high enough at the smaller company, he or she then takes his or her "enhanced" resume and lands a higher-up position at a larger company to take advantage of the prestige, higher wages, and better benefits associated with the more established firm.

monster houses—The name given to the enormous new homes constructed in the Silicon Valley area. With the onslaught of people moving to Silicon Valley and the increase of dot-com millionaires, older traditional homes are being demolished to build enormous structures that reflect the new wealth of their inhabitants.

MOPS (millionaires on paper)—Internet entrepreneurs or employees of high-tech companies who hold stock options that are worth millions of dollars. Unfortunately, the majority of these entrepreneurs and employees have few liquid assets (those that they can quickly convert into cash).

nerd birds—The airplanes that run direct flights between San Jose, Calif. (Silicon Valley) and Seattle (Silicon Forest); San Jose and Austin, Texas (Silicon Prairie); or between any other cities with a high concentration of high-tech industries. These technical commuter-filled flights have a high notebook computer-to-passenger ratio and the commuters often make new business contacts or scope out the competition.

NetGen Lab—A strategy Microsoft developed in 2000 to determine how people will use technology in the future. A group of college students spent three weeks in a house leased by Microsoft, where they created a dot-com venture using PCs, notebook computers, digital cameras, Pocket PCs, and scanners. The students were under observation the entire three weeks to determine how they used the available technology and which devices or programs they used most frequently.

netopath—Refers to the most extreme and deranged form of Internet abusers, people like the most nefarious spammers, online stalkers, and hackers who do millions of dollars of damage just because they can. The creator of the Love Bug virus is a prime example of a netopath.

post-IPO (initial public offering) millionaires—People who became millionaires when the dot-com company they owned or worked for went public on the stock market. Although the stock in some of these dot-com companies may have dropped since the IPO, many entrepreneurs have been able to maintain their millions.

scroungers—People who frequently attend technology parties in the Silicon Valley area. New computer-oriented companies tend to throw large parties to introduce themselves to the area and offer free food, drink, and entertainment. The people who search for these parties may volunteer for technology organizations or collect a network of friends who can acquire party invitations so they can crash and partake of the free goodies.

Silicon Valleyites—People who reside in the Silicon Valley area in California and commonly work for a dot-com or computer-oriented company. Silicon Valley is located south of San Francisco and consists of a number of computer companies and Internet startups. Due to the increase in new Internet companies in the Silicon Valley area and the number of people moving in to fill open positions, home and rent prices have skyrocketed and housing is difficult to find.

venture capitalists—People who work for consulting firms that invest in computer-oriented startup companies. Because there is always a chance a company may fail, it is the responsibility of venture capitalists to find companies that are likely to produce acceptable profits within a year.

Webinars—A seminar that takes place over the Internet by using software such as Microsoft NetMeeting, instant messenger applications, or even Web cams. This seminar method is a way to conduct a meeting with employees who are on the road and seminars can be broadcast via the Web for training purposes.

youth grinders—Companies that habitually hire people fresh out of college to fill demanding positions. Often, these companies pay workers lower wages than the industry average and don't offer stock options or any profit-sharing plan. Instead, youth grinders often offer free T-shirts, gadgets, and long weekends as rewards for hard work. These companies expect employees to work long hours and give them a lot of responsibility. However, the rewards rarely make up for the working hours or the lack of cash bonuses. RS

by Buffy Cranford-Petelle

The Software Industry's Tug Of War

Current Reports Indicate Piracy, Internet Use & Mobile Devices Have A Huge Impact

There's a good argument to be made that software is the true life force of the technology world. After all, it's an OS (operating system) that breathes life into a PC, notebook, or PDA (personal digital assistant). It's a browser that provides the vision to see the Internet's millions of Web pages. And ultimately, it's software that prevents portable MP3 players, digital cameras, scanners, monitors, printers, mice, DVDs (digital versatile discs), and other peripherals from being more than attractive hunks of metal and plastic.

It's easy to see why the software industry has grown into an enormous giant, both financially and in terms of the number of individuals tied to the industry, be they developers, programmers, entrepreneurs, investors, marketers, analysts, administrators, technicians, retailers, or clerks selling teen-agers copies of Diablo II at local outlets. But despite the enormity of the industry's many genres, companies, products, and titles, the industry sits on a foundation that is continually shifting.

In the past year, the considerable influence of the Internet may have shaken the industry the greatest. From an increased focus on ASPs (application service providers) to e-commerce to consumers downloading and using Napster, the Internet's shadow looms large. The Internet's influence on software is even being felt in the courtroom, where the outcome of the Microsoft vs. Department of Justice and the Recording Industry of America Association (RIAA) vs. Napster lawsuits promise to have wide-ranging ramifications.

Beyond the Internet, the software industry felt an impact this past year from new product releases,resignations, viruses, piracy, the open source movement, and more. We'll touch on some of these events and take a glimpse into the future.

Just the Facts!

Antivirus software is often equipped to battle "Trojan horses," a type of software that can be destructive to your PC. The term is derived from the wooden horse in Homer's "Illiad" that Greek soldiers used to sneak into the city of Troy.

■ A User's Profile.

According to a 2000 Consumer Software Report from the Software & Information Industry Association (SIIA), the average user owns 7.4 types of software, with word processors being the most prevalent, followed by gaming and entertainment software. The survey of 500 PC owners also shows that reference/lifestyle software is the fastest growing while creativity and graphics/drawing software have experienced double-digit declines from the previous year.

Additionally, 93% were using either Windows 95 or Windows 98 , with Win98 usage being up a huge 119% from the previous year. The survey also shows 1% use Linux, 1% use Windows 2000, and 1% use Windows NT. Around 75% own an application suite, and 8 in 10 respondents who purchased software in the previous three months own a suite.

Overall, users in the report who last purchased software a year or more ago are likely to include people without children, Apple computer owners, people whose primary PC was bought in 1997 or earlier, and people who don't use the Internet. SIIA reports the weekly usage of installed software is declining, especially among online users. SIIA's report also indicates PC owners bought fewer software titles in all main categories and were less interested in buying software during the next six months. SIIA concludes this means software publishers are competing directly with free online services and must find more compelling reasons for users to purchase their titles.

■ The Web Makes Some Waves.

Attributing to the decline of packaged software sales is the strong emergence of ASPs and the Internet, which join e-commerce as a few of the most rapidly expanding areas in the software industry.

Put simply, a typical **ASP** is a company that leases or rents software to users or businesses. Basic examples of an ASP service include online calendars, word processing programs, personal organizers, and e-mail applications that don't have to be installed to use on a PC. The ASP model gets much larger, expansive, and expensive on the corporate level. Access to applications can be provided via the Web or a private network, and applications might be offered to handle employee benefits, customer service, accounting, inventory, and more. ASPs are attractive because of their cost-effectiveness and ability to free up a company's resources, maintenance, storage, and time.

"I think in the long run, it's where the software industry is likely to end up," says Jeffrey Tarter, editor and publisher of Softletter, an industry newsletter. The ASP model is expanding partially because it's becoming difficult for users to implement, use, and maintain large volumes of software, Tarter says.

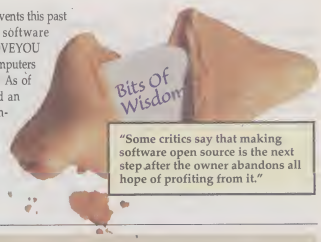
"We are at a very early stage for this model, and in some ways the industry has got it all backwards," Tarter says. "They go out and develop an ASP service, and then hope somehow they'll have a bolt of lightening strike to make it sell."

Tarter says this is "surprisingly reminiscent of the marketing strategy" about 15 years ago, but "this time the financial stakes are high enough that we can count on service marketers learning a lot faster."

IDC estimates that spending on ASP services will increase from $300 million in 1999 to $7.7

billion in 2004. An IDC survey of 400 U.S. corporate officers with influence on technology decisions indicates more than 50% are familiar with the term "ASP," and after hearing a detailed explanation of ASP, more than 33% would consider using one. A June 2000 survey by Zona Research of 131 respondents from enterprises with 20 to 18,000 employees reports that 73% of intended users will access two to six applications from an ASP in the next two years. According to Cahners In-Stat, actual ASPs will spend around $121 million this year on software, up from about $72.6 million in 1999.

In A Nutshell. Other events this past year that helped shape the software include the attack of the ILOVEYOU e-mail virus on millions of computers worldwide in early May 2000. As of August, the virus had caused an estimated $8.7 billion in damages, according to Computer Economics. Information Week Research estimates software viruses and hackers will cause over $1.5 trillion in damages in 2000 worldwide,



"Some critics say that making software open source is the next step after the owner abandons all hope of profiting from it."

Software Piracy

In this day and age of Internet startup successes and failures, antitrust lawsuits, and mergers of industry giants, topics such as software piracy don't always garner the headlines they may deserve. But one only has to dig through a few statistics associated with the piracy of software to quickly realize the impact it has on not only the software industry but also on the entire workforce and economy.

According to a survey commissioned by the Business Software Alliance (BSA) and Software & Information Industry Association (SIIA), software piracy losses across the planet totaled more than $12 billion in 1999. Stretching that total out to include the past five years adds up to more than $59 billion in losses worldwide.

It seems like such numbers would have to be linked exclusively to huge, well-organized rackets or crime syndicates, but in reality, everyday users often play a role. For example, when you pass a CD-ROM containing a killer application to a friend or co-worker who then installs it on his PC, a copyright law is broken because the program was not purchased separately by your friend or co-worker. While the intent might be harmless, the accumulative ramifications mean the loss of thousands of potential jobs, wages, and tax revenues. According to the BSA, software piracy in 1998 for the United States alone meant an estimated loss of 109,000 jobs, $4.5 billion in wages, and $990 million in tax revenue.

"The very nature of software and the ease with which software code can be duplicated has been the industry's blessing and curse," says Mike Flynn, SIIA's Internet anti-piracy division manager. "It is possible for literally anyone with a computer and a hard drive, and now an inexpensive CD-R [CD-recordable drive], to become what we call a 'manufacturing subsidiary' and create thousands of perfectly working, but illegal, copies of software. The other problem is that there is no degradation in quality as succeeding copies are made. Unlike a VCR, where the tape quality is going to decline with the increasing number of copies, this does not happen with software."

From the BSA and SIIA survey, the regions of North America, Asia, and Western Europe accounted for 83% of the $12 billion worldwide losses in 1999. The United States and Canada led all regions in 1999 with $3.6 billion, or 26%, in lost revenues from software piracy. Japan had an estimated $975 million in lost revenue, followed by England ($680 million), France ($652 million), China ($645 million), and Germany ($548 million).

According to a February 2000 release from the Interactive Digital Software Association (ISDA), which represents video game software publishers (including companies that publish games for PCs and the Internet), the gaming industry alone lost an estimated $3 billion to software piracy in 55 countries in 1999. Amazingly, that figure doesn't include Mexico, Europe, or the United States. Malaysia led the group of 55 countries with an astounding 99% piracy rate, totaling $164 million in lost revenue. Thailand, China, and the Russia region all had 95% piracy levels.

According to estimates from the BSA and SIIA survey, one in three business applications in use during 1999 were pirated. A separate national study done for the BSA by Yankelovich Partners shows employees are a leading contributor to illegal software in the workplace. The company software decision makers surveyed indicated colleagues bringing software from home accounted for 40% of the illegal software. In addition, unauthorized downloading of applications from the Internet accounted for 24%, while sharing programs with employees accounted for another 24%.

It does appear like some headway is being made in the fight against piracy, especially in the United States. Historically, the United States and Canada have one of the lowest piracy levels in the world, according to BSA and SIIA. Over the past five years, the piracy rate has dropped from 32% to 25% in North America. In addition, 75% of the decision makers surveyed in the Yankelovich workforce study said their organization had a software management program in place, with 90% citing that their policy was effective at preventing software piracy.

"In terms of enforcement in some countries, that basically comes down to the will of the authorities to go after the software pirates," Flynn says. "Having tough copyright laws on the books are useless unless they are aggressively and consistently enforced. Even in the U.S., there is sometimes a reluctance on the part of law enforcement to treat software piracy as a serious crime."

with the United States experiencing $266 billion in damages. Even so, Central Command reports a survey of 54,091 users indicates that 24% don't update their antivirus software monthly despite 62% reporting at least one virus attack the previous year, with 57% of those attacks resulting in lost data.

The industry also continued to suffer substantial losses throughout 1999 and 2000 due to software piracy. The SIIA and Business Software Alliance (BSA) say software piracy losses totaled more than $12 billion in 1999 and $59 million during the previous five years.

"As the industry moves toward the ASP model . . . this should reduce the piracy problem, and thus help to stem declining revenues," says Mike Flynn, SIIA's Internet antipiracy division manager. "Even in the U.S., there is sometimes a reluctance on the part of law enforcement to treat software piracy as a serious crime. Until it is pursued as aggressively as it can and should be, the general public will continue to have the attitude of 'Yes, it's a crime, but no one really is going to do anything about it.'"

Quick Tips

If your Windows 98 Start menu no longer sorts entries in alphabetical order, you can manually rectify the situation. Open the Start menu and go to Programs. Right-click any program group and select Sort By Name to place all entries in alphabetical order. Windows will add new entries to the bottom of the menu, so repeat the procedure when needed.

Microsoft vs. U.S. Department Of Justice

Unless you were residing deep within the damp recesses of a dark cave throughout 1999, the chances of you not being at least aware of the ongoing legal battle between software superpower Microsoft and the U.S. Department of Justice (DOJ) are slim to none. The historic antitrust lawsuit brought forth by the DOJ and 19 states against Microsoft grabbed headlines on a seemingly daily basis.

As 2000 rolls by, events stemming from the epic case continue to transpire, and it appears that the case may stretch on for years. Chronicling a blow-by-blow account of the jabs each side has thrown since the trial began before District Court Judge Thomas Penfield Jackson in October 1998 could easily fill an almanac of its own. We won't attempt that undertaking, but here's a brief summation of some of the major events from the battle throughout 1999 and 2000:

- Having begun in October 1998, the trial restarts the first week of January 1999 after a recess for the holiday season.
- Throughout the early months of 1999, testimony and depositions are heard from numerous witnesses, including Microsoft's Bill Gates and Intuit's William Harris.
- The trail resumes in early June 1999 after a three-month break due to scheduling conflicts among the trial participants. Testimony is later heard from IBM's Gary Norris, various economists, and an assortment of Microsoft executives.
- Judge Jackson hears closing arguments for the "findings of fact" portion of the trial in late September 1999.
- On Nov. 5, 1999, Jackson states in his "findings of fact" that Microsoft is a monopoly and hurts consumers by stifling competition from such companies as Sun Microsystems and Netscape Communications. In his conclusion, Jackson states, "The ultimate result is that some innovations that would truly benefit consumers never occur for the sole reason that they do not coincide with Microsoft's self-interest." Gates responds to Jackson's findings by stating, "We respectfully disagree with many of the court's findings."
- On Nov. 19, 1999, Jackson appoints Judge Richard Posner, U.S. Court of Appeals in Chicago, to mediate settlement talks between Microsoft and the government.
- On April 1, 2000, Posner states that talks between the two sides have all but failed.
- On April 3, 2000, Jackson rules that Microsoft broke national antitrust laws. Among other things, the ruling states Microsoft forced Windows 98 buyers to also accept Internet Explorer in an effort to hurt Netscape's Navigator browser software.
- On June 7, 2000, Jackson rules that Microsoft split into two separate companies, including one company to oversee operating systems and another company to handle other software applications. Microsoft files an appeal with the U.S. Circuit Court of Appeals for the District of Columbia.
- On June 20, 2000, Jackson directs Microsoft's appeal straight to the U.S. Supreme Court under the Expediting Act, which was revised in 1974 to allow cases that had national relevance to bypass the standard appeals process. Jackson also indefinitely stays business restrictions against Microsoft that were set to begin in September.
- Following Jackson's directive, Microsoft asks the Supreme Court to allow the U.S. Court of Appeals for the District of Columbia to hear the case first, citing the need for intricate review of the case rather than a quick resolution by the high court.
- In late August 2000, the Supreme Court passes on its first opportunity to hear Microsoft's appeal.

Interestingly, Americans seem to be almost evenly split on their opinions when it comes to the case, according to a survey conducted independently of Microsoft by Greenfield Online. Only 28% of the 1,800 respondents polled supported the breakup of Microsoft and 55% disagreed with the statement "Microsoft harmed consumers." However, 45% believed Judge Jackson's statements in his ruling were "reasonable." □

Dates To Remember

On July 31, 1992, Linus Torvalds posted a message to a Minix operating system newsgroup mentioning a project of his that would eventually become the Linux operating system. He asked other newsgroup subscribers for help and suggestions for his program, thus starting a legacy of open source software.

Software giant Microsoft made legal headlines throughout 2000 when U.S. District Judge Thomas Penfield Jackson ruled that Microsoft violated antitrust laws and ordered it to break into two separate companies. More positive was the company's release of the Windows 2000 and Windows Millennium Edition OSes. Then, Bill Gates made news in January when he resigned as the company's chief executive officer and handed leadership over to Steve Ballmer. Gates remains as Microsoft's chairman.

Microsoft continues to feel pressure from the upstart Linux, an open source OS that's gaining legions of loyal users and corporate supporters such as IBM and Corel. In 1999, Linux made especially great strides in the server OS area, moving past Novell's NetWare as the second-leading server OS behind Window NT. However, retail sales of Linux still pale in comparison to Microsoft. For example, in June 2000, retail sales of Linux on CD-ROM were roughly 23,000 units compared to around 160,000 units of Win98 and Win2000 versions, according to information from PC Data.

Beyond Microsoft and Linux, Napster's ongoing battles with the RIAA and heavy-metal band Metallica over the issue of copyright infringement might be the most prominent story right now. On the same front, in September, a federal judge ruled MP3.com to pay as much as $118 million in damages to Universal Music Group for illegally copying that company's cataloged CDs. As 2001 approaches, the issue of online music sharing promises to continue to stir up controversy, especially since streaming media players are quickly becoming one of the most used applications by users.

Another area to keep an eye on in the upcoming months is software related to the mobile computing movement, including wireless Internet connections and the battle between PDAs running the Palm OS and those using Microsoft's PocketPC OS. Currently, Palm owns anywhere from 65% to 80% of the market, depending on the source. Microsoft may be bumped further down the ladder by the new PDA player Handspring, which also uses the Palm OS and composed nearly 22% of the PDAs sold in the United States in June 2000, according to NPD INTELECT.

Fred Hoch, SIIA's director of eBusiness Divisions, says, "Obviously, the software industry is moving to a service model that allows for heavy computing to take place at the server, not the client. This is being done for a number of reasons, but certainly, the rise of mobile computing is the main one. Most of the industry is still in the nascent stages of dealing with this issue, and frankly, they haven't figured it out yet. However, to compete, they are going to have to figure out how to develop products that can be functional on the PC, as well as with a variety of devices with smaller form factors." RS

by Blaine Flamig

Top Software Metro Areas

The Silicon Valley is often considered the hub of the technology world in the United States, and for good reason: Many of technology's most historic and significant events, inventions, innovations, and companies have spawned from the fertile region. But when it comes to being the top metropolitan area for occupations related specifically to the software industry, the Boulder/Longmont region in Colorado tops the list.

According to a June 2000 release from the Software & Information Industry Association (SIIA) of the top 25 metropolitan areas in the United States for software employment density, the Boulder/Longmont area has more than four times the national average of software-related jobs. Among the occupations considered as software-related are programmers and programmer aides, engineers, systems analysts, and support technicians and specialists.

The list of top metro areas is based on an employment density index compiled by the SIIA using data gathered by the Bureau of Labor Statistics. According to the SIIA release, the index of metro areas is based on the number of software-related jobs divided by an area's population. The U.S. index average for software-related occupations is 100. The Boulder/Longmont area had an index density rating of 416.

Ken Wasch, SIIA president, says the index's statistics show that the software industry is helping power the economies of numerous metropolitan areas and not just the Silicon Valley. In addition, the index shows software-related employment opportunities are available in metro areas from coast to coast and not just in select areas. Wasch says that such diversity in the regions on the list means prospective software-related employees can often find jobs with stability in their own community.

The San Jose, Calif., area is the second leading area on the list, with an index rating of 397, nearly four times the national average. The Washington D.C. area is third with a 307 index rating; Raleigh/Durham/Chapel Hill, N.C., is fourth with a 283 rating; and Huntsville, Ala., is fifth with a 259 rating. Rounding out the top 10 are Colorado Springs, Colo. (251); San Francisco (231); Middlesex/Somerset/Hunterdon, N.J. (225); Boston (223); and Austin/San Marcos, Texas (223). Colorado was also represented on the list by Denver (200) at number 11 and the Fort Collins/Loveland area (156) at number 20.

Showing Competitive Muscle

Online Purchases

29% Software

37% Other

OTHER

38% CDs/DVDs/Videos

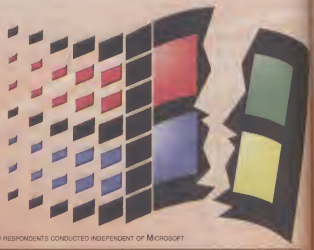
42% Books

Computer software is the fourth most purchased item online, with 29% of the respondents indicating they've purchased via the Internet. The only categories to outperform computer software online were books (42%), CDs/DVDs/Videos (38%), and other (37%).

SOURCE: ACNIELSEN HOMESCAN NET VIEWS SURVEY OF NEARLY 40,000 INDIVIDUALS • MAY 8, 2000

Microsoft Survey

- 28% of the respondents support the breakup of the Microsoft Corporation.
- 55% of the respondents said they disagree with the statement "Microsoft harmed consumers," whereas 15% were neutral and 29% agreed.



SOURCE: GREENFIELD ONLINE • STUDY OF 1,600 RESPONDENTS CONDUCTED INDEPENDENT OF MICROSOFT

1999 Holiday Shopping Sales Online

During the 1999 holiday shopping season, computer software had the most buyers among Internet shoppers for three weeks, including:

- Nov. 22 to 28—An estimated 973,000 buyers spent approximately $54.97 million.
- Dec. 20 to 26—An estimated 738,000 buyers spent approximately $52.38 million.
- Dec. 27 to Jan. 2—An estimated 699,000 buyers spent approximately $59.28 million.

Although computer software came in fourth in the category of having the most buyers among Internet shoppers in the week of Dec. 6 to 12, it's estimated 1,254,000 buyers still spent approximately $73.55 million.

SOURCE: PC DATA ONLINE

Compiled by Blaine Flanig
Graphics & Design By Andria Schultz & Carrie Benes

Online Sales For 2000

- Consumers spent an estimated $7 billion online in the first quarter of 2000, with another estimated $13.8 billion spent by phone and in stores as a direct result of online shopping.
- Computer software sales were estimated at $257 million for the first quarter of 2000, up 10% from the fourth quarter of 1999.

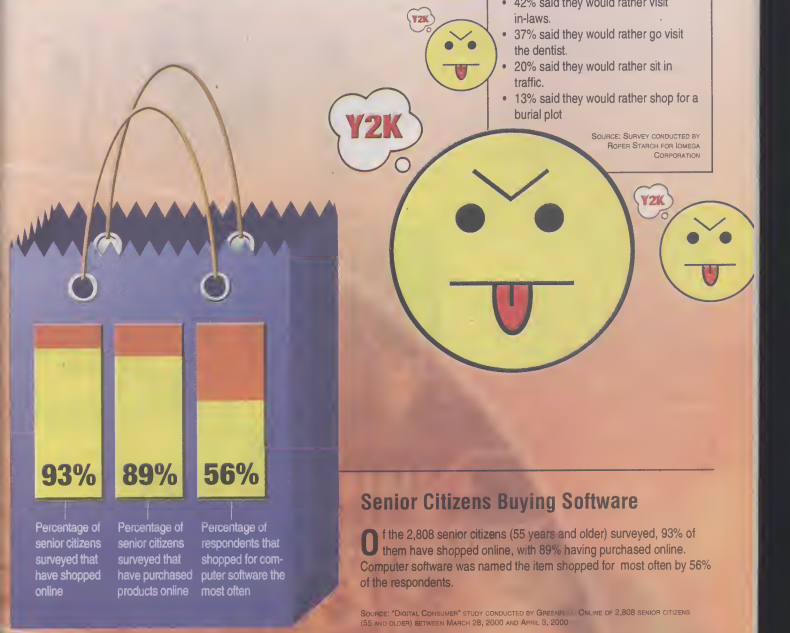
SOURCE: HARRIS INTERACTIVE E.COMMERCEPULSE SURVEY • MAY 1, 2000

Preparing For Y2K With Software

The following statistics are from a survey conducted from Nov. 4 to 7, 1999 of 1,005 adults who had not yet prepared their computers for Y2K with the appropriate software.

- 52% said they would rather eat broccoli.
- 45% said they would rather clean the bathroom.
- 42% said they would rather visit in-laws.
- 37% said they would rather go visit the dentist.
- 20% said they would rather sit in traffic.
- 13% said they would rather shop for a burial plot

SOURCE: SURVEY CONDUCTED BY ROPER STARCH FOR IOMEGA CORPORATION


Y2K
Y2K
Y2K
93%
89%
56%
Percentage of senior citizens surveyed that have shopped online
Percentage of senior citizens surveyed that have purchased products online
Percentage of respondents that shopped for computer software the most often

Senior Citizens Buying Software

Of 2,808 senior citizens (55 years and older) surveyed, 93% of them have shopped online, with 89% having purchased online. Computer software was named the item shopped for most often by 56% of the respondents.

SOURCE: "DIGITAL CONSUMER" STUDY CONDUCTED BY GREENFIELD ONLINE OF 2,808 SENIOR CITIZENS (55 AND OLDER) BETWEEN MARCH 28, 2000 AND APRIL 3, 2000

Source: PC Data

Who Wants To Be A Millionaire?

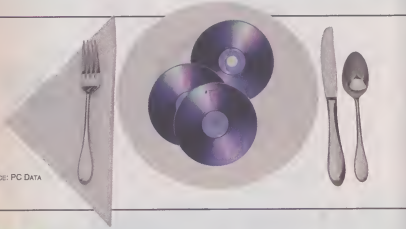
Disney's Who Wants To Be A Millionaire game soared to the top of the PC software sales list just three weeks after it was introduced in November 1999, selling about 100,000 copies in that time frame (without any television promotion).

Electronic Arts' The Sims game nabbed the top spot from Who Wants To Be A Millionaire when it was released on Feb. 2, 2000. The Sims sold 215,00 units in a three-week time frame, producing $8.6 million in sales. The game had already been translated into 14 languages, attracted an older demographic (18 to 30 years old) than most games, and appealed to more women (an estimated 25% of its audience). Electronic Arts said it would kick off a television advertising campaign in April 2000 for the game, the first time a manufacturer has done so for a PC game.

Thanksgiving 1999 Increase In Software Sales

Software unit sales during Thanksgiving week of 1999 rose 45.2% over the same week in 1998. Revenues for software sales rose 42%.

The gains are attributed to the sales of discounted PCs sold in the previous six months.



Source: PC Data

Unit Sales Gains Of Companies

These software companies showed the greatest unit sales gain from Thanksgiving week of 1998 to Thanksgiving week of 1999:

- Symantec unit sales were up 129.8%
- Hasbro was up 123.5%
- Disney was up 117.9%
- Microsoft was up 53.8%

Source: PC Data

Virus Detection Software Sales

Retail sales of virus detection software increased more than 67% during the week of the Melissa virus from March 28 to April 3, 1999. Specifically, the sales of Symantec's Norton AntiVirus software increased 78% and the sales of Network Associates' VirusScan and Dr. Solomon's Anti-Virus were up 51%.

Usage Of Tax Software

- One in four respondents, ages 25 to 34, predicted they would use computer software or the Web to prepare and file their taxes in 2000.
- Only 8% of senior citizens planned to use computer software or the Web to prepare and file taxes in 2000.
- 52% of all respondents planned to use an accountant to prepare their federal taxes in 2000.

SOURCE: A 1999 TURBOTAX SURVEY COMMISSIONED BY INTUIT AND CONDUCTED BY ROPER STARCH WORLDWIDE OF 1,011 U.S. CITIZENS

Were You Smacked By The ILOVEYOU Virus?

- 26% of those with Internet access at work said their companies were exposed to the ILOVEYOU virus.
- Of that 26%, 47% said their employers' computer systems were damaged by the virus.
- 9% said that although damage was controlled, systems were shut down to eliminate more damage.
- 3% of those polled with Internet access at home said they were hit by the virus.
- 50% agree that viruses pose a dangerous threat to the use and growth of the Internet.
- 50% said that computer viruses are bound to happen on occasion but pose no long-term threat to the Internet.
- 50% are confident that large corporations, governments, and the computer industry can limit damage caused by hackers.

SOURCE: ANGUS REID GROUP POLL OF 1,000 U.S. ADULTS ABOUT THE ILOVEYOU SOFTWARE VIRUS

Virus Attacks

From Computer Economics:

- The economic impact of software virus attacks on information systems worldwide totaled $12.1 billion in 1999.
- The Melissa and Explorer.zip viruses were cited as the two primary factors in this total.
- The ILOVEYOU virus and subsequent copycats caused $6.7 billion in damages in the first five days after they were released. As of August 2000, they have caused $8.7 billion in damages worldwide.

From Information Week Research's study of 4,900 IT professionals in 30 countries:

- Viruses and computer hackers will cost businesses worldwide more than $1.5 trillion in 2000.
- 50,000 firms (with more than 1,000 employees) in the United States alone are estimated to be large enough to be impacted by a software virus or hacker. The total damages to U.S. businesses is estimated to be $266 billion in 2000.

1999 Global Software Piracy Report

The illustrations on this page are from a study conducted by the International Planning and Research Corporation for the Business Software Alliance and Software & Information Industry Association in May 2000. The resulting figures are part of the BSA/SIIA Piracy Study Final Report.

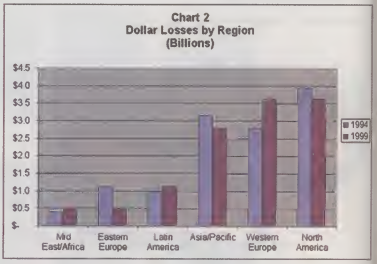
Top 25 Countries By Piracy Rate

As this table illustrates, countries in Asia have the highest piracy rates in the world. As in 1994, Vietnam and China again top the list for 1999. Vietnam has only seen minor changes in its piracy rate in five years, while China has moved down six percentage points. Russia and its neighboring former Soviet countries also have not improved more than six percentage points.

	1994	1999
Vietnam	100%	98%
China	97%	91%
CIS (less Russia)	95%	90%
Russia	95%	89%
Lebanon	93%	88%
Oman	96%	88%
Indonesia	97%	85%
Bolivia	93%	85%
Paraguay	95%	83%
El Salvador	97%	83%
Pakistan	95%	83%
Bahrain	92%	82%
Thailand	87%	81%
Kuwait	91%	81%
Romania	93%	81%
Nicaragua	94%	80%
Qatar	91%	80%
Guatemala	94%	80%
Bulgaria	94%	80%
Egypt	84%	75%
Jordan	87%	75%
Honduras	89%	75%
Turkey	90%	74%
Other Latin America	79%	72%
Dominican Republic	89%	72%

Billion Dollar Losses By Region

The chart below illustrates how the dollar losses have changed among regions throughout the world. In 1994, North America experienced most of the losses, but in 1999, Western Europe had pulled almost even. In 1994, Eastern Europe and Asia also faced significant financial losses to piracy and growing economies. Since 1994, dollar losses have fallen in both regions due to recessions. Conversely, dollar losses have risen in Latin America, the Middle East, and Africa as economic growth outpaces their respective declines in the piracy rate.



SOURCE: 1999 GLOBAL SOFTWARE PIRACY REPORT CONDUCTED FOR THE BSA (BUSINESS SOFTWARE ALLIANCE) AND SIIA (SOFTWARE & INFORMATION INDUSTRY ASSOCIATION)

Scrutinizing MP3 Users

Gartner surveyed 40,000 U.S. households in February 2000, and its survey revealed that MP3 users are buying three more CDs on average in a six-month period than non-MP3 users. Plus, 58% of all MP3 users still buy CDs in stores compared to 50% of the general public. In addition, 30% of MP3 users use the Internet to buy CDs and 41% get product information online, compared to 8% of the general population purchasing CDs and 12% of the general population getting product information online.

SOURCE: GARTNER

Napster Use By College Students

- 58% of the students have used Napster to download music from the Internet, but 79% still plan to purchase music by their favorite recording artists.
- 73% of the students say they have downloaded music from the Internet in general, with 61% having downloaded up to 100 files. 23% have downloaded 101 to 500 files. 16% have amassed a library of 501 to 1,000 music files.
- 18% say their college has imposed restrictions on Napster usage, 47% say their school doesn't restrict Napster usage, and 35% don't know of any restrictions in place at their school.

SOURCE: "PULSEFINGER ON-CAMPUS MARKET STUDY," A JOINT STUDY BY GREENFIELD ONLINE AND YOUTHSTREAM MEDIA NETWORKS OF 1,135 PARTICIPANTS FROM A PANEL OF 30,000 FOUR-YEAR COLLEGE STUDENTS (CONDUCTED MAY 21 TO JUNE 9, 2000)

Downloading Music Files

- Only 16% of those polled agreed that services such as Napster should be shut down.
- 50% disagreed that free music obtained from the Internet is piracy and should be illegal. 23% agreed that free downloaded music was illegal, and 30% had no opinion.
- 25% said they planned to continue to use free-exchange services such as Napster even if the courts determine that they are a form of piracy.
- 60% said they feel Napster actually helps the music industry by offering access to music users who are likely to buy. 14% disagreed.
- 40% said they planned to download the same amount of free music during the next year, 32% said they planned to increase the amount of music they download, and 28% said they plan to download less music.
- 35% said free downloads were the way they acquired most of their new music during the past year. 84% identified stores as the main way they purchase music, and 44% identified online retailers.

SOURCE: PC DATA ONLINE POLL OF 1,560 HOME INTERNET USERS FROM JUNE 21 TO 26, 2000

Becoming A Player In The Game Of Selling Software

Application Developers Find Out Ingenuity, E-commerce & Internet Integration Are Crucial Factors

When the name of the game is selling software, no company reaps in as much revenue in as many market segments as Microsoft. That's hardly a newsflash to anyone with even a smidgen of knowledge about the software industry. But what is often overlooked is just how dominant the company is in the software world.

According to U.S. retail software sales figures for 1999 from PC Data, Microsoft was not only the top software publisher for the year with about $1.36 billion in revenues for a 24% market share, it had nearly double the revenues of the next closest publisher, Mattel Interactive, which had about $6.77 million in revenues for a 12% market share. Those figures don't even touch the considerable revenues Microsoft collects in scads of markets outside of the consumer retail realm.

The margin over Mattel is even more impressive considering Mattel sold about 28.4 million U.S. retail units in 1999 compared to just 13.6 million units for Microsoft. Rounding out the list of top software publishers for 1999, based on U.S. retail sales, are Havas Interactive, Intuit, Symantec, Adobe, Electronic Arts, Hasbro Interactive, Network Associates, and Activision.

■ **Microsoft Dominance.** Jeffrey Tarter, editor and publisher of industry newsletter Softletter, says Microsoft isn't an important competitor in every market segment, but "even in market segments where they haven't been a serious player, their mere presence has the ability to shake up the market tremendously."

"I think what is amazing about Microsoft is how much it is actually underestimated by almost everybody in the market as a force," Tarter says. "The reality is that the company is much greater in total revenue dollars, market share, market capitalization, profitability, than almost any other total segment of the market. It's not just the big bully on the block. To a large extent, it is the block. And that's really a scary proposition when you look at the issues of competition. There really isn't a lot of alternative to Microsoft in most of the market."

That's not to say that Microsoft doesn't have challengers. The open source movement, and the Linux operating system in particular, is gaining increasingly more users and gradual market shares, especially in the server operating system market. In addition, several industry experts have said Microsoft is operating behind the curve where Internet-related software is concerned, especially when more users begin to abandon the PC to access the Web and instead use smaller, more mobile devices.

In the PDA (personal digital assistant) arena, sales of PDAs using the new Microsoft PocketPC OS (operating system) appear to be lagging far behind those using Palm's OS. According to NPD INTELECT, in June 2000, Palm owned 65.4% share of the PDA market, and Handspring, which also uses the Palm OS, had a 21.6% share. Conversely, Casio and Hewlett-Packard, makers of PocketPC PDAs, had 4.4% and 3.3% shares, respectively.

Tarter says Microsoft shouldn't be counted out of any market, however. "The scary thing is they are growing like crazy. As far back as I can remember, everybody keeps saying they can't continue to grow at this rate. But they are still growing 10% to 20% a year. In a saturated market, that is just amazing."

According to PC Data, information gathered from January through June 2000 indicates Microsoft has totaled about 7.8 million U.S. retail unit sales for about $826 million, or a 27% revenue market share. Intuit falls behind with an 8% revenue share, or about $255 million based on nearly 5.7 million U.S. retail unit sales. Mattel leads all software publishers in units sold with about 10.3 million, or a 13% unit share for $222.7 million. Finishing out the top 10 publishers, based on revenues from U.S. retail sales through June, are Havas Interactive, Symantec, Electronic Arts, Adobe, Hasbro Interactive, Activision, and Disney.

Dates To Remember

In 1963, the ANSI (American National Standards Institute) accepted a 7-bit computer language code called ASCII (American Standard Code for Information Interchange) as the standard for information exchange between computers.

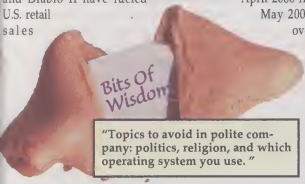
Just the Facts!

The first spreadsheet software, VisiCalc by Software Arts, let users enter data into rows and columns for calculations. The software required about 27KB (kilobytes) of hard drive space and was later purchased by Lotus Software.

■ **The Other Retail Sales Markets.** Scanning the entire U.S. retail software market for 1999 indicates revenues jumped 8.7% from the previous year to $5.6 billion, according to PC Data. The consumer retail markets showing the greatest growth in 1999 were finance and business with grow rates of 23.2% and 10.4%, respectively. Gaming software revenues increased 9.2% in 1999, followed by

personal productivity at 2%, and education software at 1.2%. Retail sales for reference software was the big disappointment in 1999, sinking 12.2% from the previous year.

Thus far in 2000, the gaming market has been the hottest retail segment in the U.S., while other retail segments have experienced a somewhat lackluster year in terms of growth. According to PC Data research, PC games such as The Sims, Who Wants To Be A Millionaire, and Diablo II have fueled U.S. retail sales



while reference, personal productivity, and education categories have been on a downward slide compared to 1999. Business software had been holding steady through the first half of 2000, but it also slipped 9.3% in June, compared to the same month last year.

According to PC Data, June 2000 retail sales of gaming units were up more than 15% from June 1999, totaling about $120.7 million in sales. The gaming segment was up 15.1% in April 2000 from April 1999 and up 8.6% in May 2000 from May 1999. In terms of overall June 2000 sales, the gaming segment fell just behind business software, which had June 2000 revenues of about $246 million. However, that total was down from $271 million in June 1999. According to PC Data research, June also marked the first month in 2000 in which gaming was the only U.S. retail software segment to show growth, with every other category being down from the same month a year ago.

Outside of the retail market, many software segments seem to be thriving, in part due to the increasing influence the Internet is having on how businesses are changing their operational models. Overall, unit sales and revenue growth in numerous software markets appear to be growing at a very healthy clip.

According to IDC, the packaged software market totaled $154 billion in revenues in 1999 worldwide, up 14.5% from 1998. IDC projects the market will continue to grow throughout 2000 at a 14% growth rate. For 1999, the packaged software's largest segment was applications, which grew 13.3% to $70 billion. The system infrastructure segment within the packaged software market had the biggest jump in 1999, increasing 16% to $48 billion. Microsoft was the market's largest vendor in 1999, increasing its revenues 25.9% from the

The Popularity & Success Of Gaming Titles

Games played on a PC may not exactly be the type of software that immediately leaps to the front of your mind when you think of software. After all, when it comes to practical uses, the operating systems, browsers, office suites, spreadsheets, media players, antivirus utilities, and security applications all have a definite nod over PC games. But when it comes to unit sales, revenues, and popularity among consumers, PC games easily hold their own.

According to the Software & Information Industry Association's (SIIA's) 2000 Consumer Software Report, game and entertainment software is the second most popular type of home software for six years running, falling only behind word processing software as the most prevalent application used in homes with a PC. The typical PC gaming household spends an average of nine hours per week playing an average of 10 game and entertainment titles.

"One reason for the popularity is that the installed base of PCs has never been higher and a lot of people are interested in entertainment on the PC," says Steve Koenig, a senior analyst for PC Data. "The bigger your installed base of customers is, the higher the demand is going to go up."

In an April 2000 release, the Interactive Digital Software Association (IDSA) reports that a survey conducted by Peter D. Hart Research Associates of 816 households indicates three out of five Americans (or a projected 145 million people), age six or older, routinely play computer or video games, with 43% of that total being female. PC Data Online reports that 60% of hardcore gamers are 25 years old and younger and 45% are younger than 18.

In IDSA's April release, IDSA President Douglas Lowenstein says that according to data from NPD Group, PC game sales increased 15.5% from $1.8 billion in 1998 to $1.9 billion in 1999.

"The new face of gamers is a major reason why interactive entertainment is a growing and influential force that's shaping our culture, redefining entertainment, pushing technology forward, and helping to power the high-tech economy of the 21st century," Lowenstein says.

The popularity of PC games can be further demonstrated by examining PC Data's list of top selling software for 1999 for all market segments. Of the top 20 selling titles, eight were PC games. According to Koenig, the game Diablo II from Blizzard Entertainment, a division of Havas Interactive, sold around 260,000 units in about a one-month time span following its release in the summer of 2000.

Numerous other companies have also reaped the benefits from publishing PC games. According to PC Data, the release of the Who Wants To Be A Millionaire PC game helped Disney grab a 4.5% revenue share of the gaming market during the summer of 2000. That was up from a 0.5% market share in May 1999. The huge success of The Sims helped Electronic Arts achieve a 22.4% gaming market share, almost double the share it held the previous year.

As a whole, according to a July 2000 PC Data report, retail sales for the gaming market were up 11.3% from around 4.7 million units in June 1999 to around 5.2 million units in June 2000. Revenues were up 15.1% from about $104.8 million in June 1999 to around $120.7 million in June 2000. Incredibly, June was the first month in 2000 in which the only consumer software segment to show growth was computer games.

previous year to $17.4 billion, claiming an 11.3% market share.

That type of growth was indicative of other segments, as well. According to Dataquest, revenues for the worldwide database software market reached nearly $8 billion in 1999, up 18% from the previous year. The report shows Oracle held a 31% market share, followed by IBM with a 29.9% share, Microsoft with a 13.1% share, and Informix with a 4.3% share. Dataquest forecasts that the market will reach $12.7 billion by 2004.

In the worldwide enterprise system management software market, IDC reports revenues of slightly less than $12 billion were responsible for a 23% growth in 1999. The market is projected to reach $26 billion by 2004, showing a 117% increase. Datamonitor reports the global call center software market will nearly triple its growth from 1999 to 2003, moving from $2.9 billion to $8.5 billion in revenues.

Quick Tips

If you want to make Windows 98 boot faster, you can quickly choose which programs Windows should load during startup. From the Program Menu, click Run and type **msconfig** to open the System Configuration Utility. Click the Startup tab to view a list of programs Windows loads when it boots. Uncheck the check box, and Windows will no longer boot that program the next time Windows starts.

Looking Toward The Future.

According to a June 2000 study from AMR Research, the enterprise application market will expand to $78 billion by 2004, an increase of 24% annually from the $27 billion in revenues charted in 1999. AMR Research attributes the growth to such Internet market areas as supply-chain management and e-commerce applications. The supply-chain management segment is expected to climb from $3.8 billion in 1999 to $20.3 billion by 2004, while e-commerce applications is projected to move from $1.7 billion in 1999 to $16 billion in 2004.

Internet-Related Software Is On The Rise

As the uses of the Internet continue to greatly expand, it only makes sense that the software we use to access all those capabilities is becoming more prevalent on our PCs and is being used more often. A quarterly Home PC Portrait released by PC Data in August 2000 provides some interesting insight as to what types of Internet-related software are installed on users' systems and the specific titles being used.

According to the PC Data report, which was compiled using tracking software installed on the home PCs of about 13,000 panelists, browser software was installed on 100% of the PCs monitored. That lofty percentage makes sense considering Microsoft Internet Explorer's proliferation on new PCs sold.

Among the Internet software categories in the report charted for usage patterns, e-mail software had an impressive 91.4% usage share among PC users, while streaming media players had a 78.6% share. Instant messaging software was installed on 60.4% of users' PCs, while Internet utilities had a 59.8% share, Internet plug-ins had a 46.1% share, music sharing software had a 16.8% share, and music jukeboxes had a 12.5% share.

When it comes to browser software on users' PCs, the report indicated that various versions of IE were installed on 80.8% of PCs. Netscape's various Navigator browsers charted a 29.8% usage share, followed by NeoPlanet with a 1.7% usage share. Among the specific browser versions, IE 5.5 had a 68% share, which outdistanced Navigator 4.7 with a 13.7% share.

According to the report's finding on the usage of e-mail software, Microsoft Outlook Express led other programs with a 42.6% share among PC users. Among the 91.4% of PC users that indicated they had e-mail software installed on their machine, Outlook Express had a usage share of 46.6%. The biggest contenders following Outlook Express were Hotmail with a 34.1% usage share among all PC users, AOL Mailbox with a 33.1% share, Yahoo! Mail with 22.7%, and Outlook with 10%.

One of the fastest growing areas for Internet-related software in terms of usage is streaming media players. In this category, PC Data's report indicated that RealPlayer was installed on 63.5% of PCs. Among the users with a streaming media player installed on their system, RealPlayer had a nearly 81% usage share. Windows Media Player was installed on 43.4% of all PC users' systems and had a 55.3% usage share among those with a streaming media player installed.

Instant messaging software is another area of Internet-related applications that is growing at a fast rate. Steve Koenig, senior analyst for PC Data, says, "The criticism that the Internet is an impersonal medium is no longer true. Software applications that enable streaming media and distant messages have transformed the home computer into an active and fluid exchange of music, video feeds, and dialog. As Internet access speeds increase and users become more technically sophisticated, these applications will expand to make the Internet experience more animated and exciting."

According to the Home PC Portrait report, when it comes to instant messaging software, AOL Instant Messenger was installed on 38.8% of the panelists' PCs. ICQ charted an 18.7% usage share, while MSN Messenger Service had a 18.5% usage share, and Yahoo! Messenger had a 17.3% share.

Among music-sharing software, Napster was installed on 16.7% of all systems and held a 99.3% usage share of the specific users who had music-sharing software installed on their PCs. Gnutella was installed on 0.5% of all PCs and had a 3% usage share among those with music sharing software installed. □

Not surprisingly, e-commerce is becoming a focal point for nearly all businesses. A study from Forrester Research indicates U.S. companies will spend 72% more on e-commerce in 2000 than 1999. The study was done by interviewing IT (information technology) and e-commerce executives in charge of Internet spending at 26 B2B (business-to-business) firms, 18 B2C (business-to-consumers) firms, and six firms selling to both businesses and consumers. Forrester's study estimates U.S. companies will spend $14.5 billion on e-commerce software by 2003, up from the $3.1 billion spent in 1999 and the $7.8 billion projected for 2000. The study shows companies spent an average of $24 million on e-commerce in 1999 and will spend an average of $41 million in 2000.

Fred Hoch, director of the Software & Information Industry Association's (SIIA's) eBusiness division, says, "E-commerce has forced the software industry to move on beyond the provincial boundaries of the PC and to look at a much broader landscape. The connectivity created by the Internet . . . changes the very dynamics of what was once a very static product. All products must now integrate with some sort of e-commerce, or e-business, capacity, and the random factors associated with this add a new dimension to software development. Frankly, there aren't any companies that aren't integrating e-commerce or e-business capacities into their products now. The product is out of the box, pun intended, and the development to address the Web is now the defining factor."

With 2001 approaching, the Internet will undoubtedly continue to have a profound impact on every software market, for better and worse. That can be evidenced in the growth rates business-related software markets are experiencing and the trend of average consumers using installed software applications less in lieu of the Internet, as indicated in a recent SIIA 2000 Consumer Software Report. NS

by Blaine Flamig

Linux & The Trend Toward Open Source Code

Some press accounts would have you believe the open source trend, and Linux in particular, is nipping at Microsoft's heels and will soon trip the software giant up. While Linux is making undeniable strides in gaining name recognition and revenue shares, it appears there's still considerable ground to cover before it pulls even.

"It's amazing what a stable operating system can do in the market," says Jeffrey Tarter, editor and publisher of industry newsletter Softletter. "I guess I see the Linux movement largely as a part of a zero-sum game with Microsoft. Very roughly speaking, every copy of Linux that gets installed is a copy of Windows 2000 that is not installed. And that's a big problem for Microsoft at the top end of the market. They own the PC desktop [market]. They are not nearly as secure a player at the high end of the market, where these days, most of the dollars are."

In short, the open source movement is based on the idea that any programmer has free access to a program's source code, or core instructions, to build upon and improve them. This differs from only one programmer or company owning the source code. Linux is probably the best current example of an open source program.

According to a July 2000 release from IDC, Linux passed Novell's NetWare in 1999 as the world's second-leading server operating system for new license shipments, falling behind Windows NT. IDC expects Linux shipments to increase at a 28% compound annual growth rate during the next four years, with shipments going from 1.3 million in 1999 to 4.7 million in 2004. IDC expects Linux revenues to increase faster than the rest of the market at a 23% growth rate, ultimately exceeding $85 million in 2004. In the client operating system market, IDC predicts Linux and other open source products' revenues to increase from $36.9 million in 1999 to $93.3 million in 2004.

While those numbers are encouraging, they are a fraction of Microsoft's revenue shares. According to IDC, Microsoft's NT Workstation revenues grew by $1.6 billion in 1999, with Windows products were responsible for 87% of revenues in the client-operating market in 1999. IDC predicts Windows products will account for about 85% of that market's revenues by 2004.

Dan Kusnetzky, IDC's vice president of system software, stated in the release that, "From a revenue perspective, Linux is nothing more than a speck of sand on an ocean beach. While there has been much hype about Linux, our research indicates the total market for Linux operating system software in 1999 was about $67 million—or about the same amount of revenue that Microsoft's operating systems business generated by noon on the third working day."

Yet, Linux continues to gain momentum. More than 25 million users worldwide are reported to use Linux, which is based on the Unix operating system. Sun Microsystems recently released software to make it easier to use Linux products internationally, and in August 2000, Intel, IBM, Hewlett-Packard, and NEC announced the formation of an Open Source Development Lab to help Linux products better meet enterprise computing needs.

Tarter says with less PCs being sold, Microsoft's desktop operating system revenues will probably decrease, and workstation, server, and database markets will grow. According to Tater, Linux should resist competing with Microsoft head to head in the desktop area, though.

"The problem I see with Linux is that there is this terrible temptation for the Linux companies to compete head to head with Windows on the desktop. Almost every high-end operating system has failed because the developers were seduced into competing head to head with Windows on the desktop," Tarter says. "Yes, [the open source movement] will take away some sales, but look at the actual revenues for some of these companies—it's a rounding error. Which is not to say Microsoft is not aware, because it's a lost sale and a foot in the door. But to have long-term credibility and market muscle also requires some real revenue dollars. At this point, Microsoft is the only one with real revenue dollars."

Meet The Players Of Software Warfare

Median Software Purchaser Age

Year	Game/ Entertainment	Educational/ Edutainment	Personal Productivity
2000	30	37	39
1999	33	36	40
1998	34	35	38
1997	33	34	39
1996	32	36	39
1995	33	36	38
1994	31	37	40
1993	32	37	38

SOURCE: SIIA (SOFTWARE & INFORMATION INDUSTRY ASSOCIATION) CONSUMER 2000 REPORT

Top 10 Publishers Overall By Retail Dollars For June 2000

Rank	Publisher	Total Units	Total Dollars
1	Microsoft	1,202,459	$131,414,909
2	Havas Interactive	1,448,973	$39,958,642
3	Mattel Interactive	1,231,513	$24,844,252
4	Symantec	645,030	$24,580,454
5	Electronic Arts	949,636	$23,975,988
6	Adobe	257,826	$23,172,840
7	Intuit	125,744	$13,164,913
8	Hasbro Interactive	546,360	$10,783,754
9	Activision	467,471	$10,315,653
10	Disney	399,895	$7,061,990

SOURCE: PC DATA

The Operating Systems Of Web Surfers

For Web surfers, trusting the operating system that runs on the inside of their computers is just as important as the Web browsers, add-ons, and plug-ins that display Internet content on-screen. Here are some recent statistics regarding which operating systems Web surfers prefer.

SOURCE: WEBSNAPSHOT.COM, USING SUPERSTATS TRACKING SYSTEM AND MYCOMPUTER.COM NETWORK, PCH AUG. 21, 2000.

Peering Into The Future

NOW

- The U.S. market for packaged e-commerce software will reach $14.5 billion in 2003.
- Spending on packaged e-commerce software will increase from $3.1 billion in 1999 to $14.5 billion in 2003.
- Large companies will account for 50% of e-commerce software spending through 2003, while smaller firms will lease software from ASPs (application service providers).

*Commerce Software Tax: O[illegible] by Forrester Re[illegible]

Total Retail Unit Sales For Operating Systems (CD Linux Platform) By Publisher: January To June Yearly Analysis

Publisher	Year To Date 2000	Year To Date 1999
Red Hat	95,146	74,179
Corel	34,531	
Linux-Mandrake /Macmillan	54,719	
SuSE	30,786	11,780
Macmillan	26,751	113,753
TurboLinux	21,985	1
Caldera	14,178	15,563
Walnut Creek	2,600	243
Loki Entertainment	3,438	
Terra Soft Solutions	411	
Mandrake	115	
Stormix	98	
LinuxOne	54	
Info Magic	36	93
Total Of Category	**284,848**	**215,612**

NOTE: Based on 100% Estimates
Source: PC Data

Total Retail Dollar Sales For Operating Systems (CD Linux Platform) By Publisher: January To June Yearly Analysis

Publisher	Year To Date 2000	Year To Date 1999
Red Hat	$4,853,901	$3,906,236
Corel	$2,184,150	
Linux-Mandrake/Macmillan	$1,604,019	
SuSE	$854,865	$349,782
Macmillan	$753,503	$3,985,976
TurboLinux	$568,766	$11
Caldera	$435,828	$569,883
Walnut Creek	$74,574	$8,283
Loki Entertainment	$68,742	
Terra Soft Solutions	$29,355	
Mandrake	$3,565	
Stormix	$3,558	
LinuxOne	$300	
Info Magic	$234	$1,662
Total Of Category	**$11,435,360**	**$8,821,833**

NOTE: [illegible] on 100% Estimates
Source: PC Data

Total Retail Software Dollar Sales By Category

Category	June 2000	June 1999	Change
Business	$245,990,060	$271,214,959	-9.3%
Games	$120,700,542	$104,874,867	15.1%
Personal Productivity	$39,131,472	$41,862,174	-6.5%
Education	$29,024,556	$37,379,223	-22.4%
Finance	$16,197,965	$20,337,075	-20.4%
Reference	$2,929,982	$5,746,771	-49.0%
Total	**$453,974,577**	**$481,415,069**	**-5.7%**

[illegible]: Estimated [illegible]% of the Market
Source: PC Data

Top Netscape Plug-ins

Here are recent statistics of the most popular Netscape plug-ins used by Web surfers to access online content.

Netscape Plug-ins	Users
Shockwave Flash	82.33%
LiveAudio	78.38%
Headspace Beatnik Player Stub V1.0.0.1	58.11%
RealPlayer G2 LiveConnect-Enabled Plug-In (32-bit)	53.19%
Shockwave for Director	46.90%
Adobe Acrobat	39.71%
Microsoft Windows Media Services	33.55%
QuickTime Plug-In	32.29%
Windows Media Player Plug-in	25.06%
Netscape Media Player	19.17%
SmartDownload	18.72%
Comet Cursor	14.43%
MJuice Download Plugin	11.60%
Cosmo Player 1.0	8.37%
RealJukebox NS Plugin	7.89%
Headspace Beatnik Helper Plugin V1.0.1	7.48%
QuickTime Plug-In 4.1.2	7.02%
Microsoft ActiveX Portability Container (NPWrap)	6.93%
VivoActive Player Version 2.1	5.78%
Undefined	5.69%
Shockwave Flash 2.0	5.63%
Netscape vCalendar Plug-in	5.45%
QuickTime Plug-in 4.0.1	5.28%
QuickTime Plug-in 4.1	5.18%
Yahoo! Audio Conferencing Plugin	5.05%
Cosmo Player 2.0	4.72%
PDFViewer	4.61%
FutureSplashPM RealPlayer LiveConnect-Enabled Plug-In (32-bit)	4.26%
RealPlayer G2 LiveConnect-Enabled Plug-in (Mac)	4.20%
	3.87%

Source: WebSnapshot Com, using SuperStats tracking system and MyComputer.com Network, for Aug. 21, 2000.

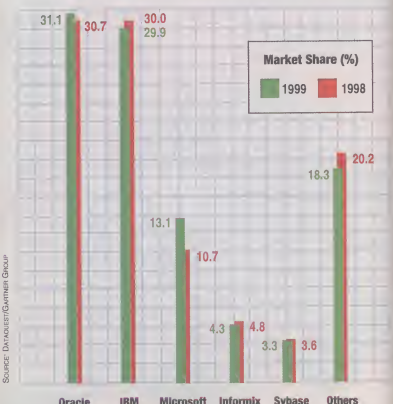
Global Call Centers

- The global call center software market is expected to triple in size to $8.5 billion by 2003.
- The market is now worth $2.9 billion.
- Customer care software makes up the largest segment of the call center software market, and it reported sales of more than $690 million in 1999.

Source: Datamonitor analysis report "Portunities in Global Call Center Software Markets"

1999 Worldwide Database New License Revenue Market Share

Revenue for the worldwide database software market was nearly $8 billion for 1999, up 18% from 1998. The worldwide database industry is estimated to reach $12.7 billion by 2004.



Source: Datadigest/Gartner Group

Top 10 Publishers For Education Software By Retail Dollars For June 2000

Rank	Publisher	Total Units	Total Dollars
1	Mattel Interactive	508,214	$9,322,931
2	[illegible]	[illegible]	[illegible]
3	Humongous (Infogrames)	200,640	$3,032,162
4	[illegible]	[illegible]	[illegible]
5	Transparent Language	26,988	$1,240,598
6	[illegible]	[illegible]	[illegible]
7	Countertop Software	30,278	$567,919
8	[illegible]	[illegible]	[illegible]
9	Mathsoft	12,260	$385,908
10	[illegible]	[illegible]	[illegible]

Top 10 Publishers For Personal Productivity Software By Retail Dollars For June 2000

Rank	Publisher	Total Units	Total Dollars
1	Mattel Interactive	311,358	$8,872,846
2	Microsoft	206,156	$7,864,780
3	Havas Interactive	184,491	$5,546,974
4	Adaptec	24,988	$2,083,325
5	MGI Software	36,566	$1,240,884
6	Punch Software	24,344	$1,206,831
7	DeLorme	21,068	$1,103,163
8	Cosmi	97,461	$965,155
9	Canon	25,784	$760,460
10	My Software	45,446	$753,341

NOTE: BASED ON 100% ESTIMATES.
SOURCE: PC DATA

Top 10 Publishers For Finance Software By Retail Dollars For June 2000

Rank	Publisher	Total Units	Total Dollars
1	Intuit	125,714	$13,149,263
2	Peachtree	8,540	$1,183,223
3	Microsoft	24,178	$991,479
4	MIPS Dataline America	15,673	$403,433
5	My Software	10,993	$218,218
6	Landware	2,310	$64,359
7	MYOB US	315	$56,334
8	On The Go Software	1,715	$48,056
9	E-Z Legal	1,566	$28,586
10	Vorton	828	$15,203

NOTE: BASED ON 100% ESTIMATES
SOURCE: PC DATA

Total Retail Sales

Retail software revenue for 1999 grew to $5.6 billion, an 8.7% increase over 1998 revenue reports.

- Finance and business software experienced the biggest increases, with finance software retail sales increasing 23.2% and business software retail sales increasing 10.4%.
- Game software retail revenue increased 9.2%.
- Personal productivity software retail revenue increased 2%.
- Educational software retail sales increased 1.2%.

In addition, the average prices for retail software dropped 1.8% to $37.91

SOURCE: PC DATA

Top 10 Publishers For Games By Retail Dollars For June 2000

Rank	Publisher	Total Units	Total Dollars
1	Havas Interactive	875,469	$27,341,957
2	Electronic Arts	947,861	$23,957,021
3	Hasbro Interactive	546,360	$10,783,754
4	Activision	399,608	$9,501,370
5	Microsoft	227,953	$7,834,187
6	Infogrames Entertainment	329,579	$5,829,446
7	Mattel Interactive	364,741	$5,724,410
8	Interplay	180,540	$4,377,716
9	Disney	239,485	$4,133,487
10	Eidos Interactive	110,333	$2,828,169

SOURCE: PC DATA

PC High Scores

- U.S. retail sales of interactive console and PC games reached more than $7.4 billion in 1999. PC game software comprised 18.6% of those sales.
- Havas Interactive was the leading publisher of PC game software for 1999 with two titles in the top-sellers list: Half-Life (No. 6 on the list) and StarCraft (No. 5). Havas claimed a unit share of 16.8% and a dollar share of 15.7%.
- Electronic Arts was the second-leading publisher of PC game software with a 13.1% unit share and 14.3% revenue share. The company's SimCity 3000 was the second best-selling PC game title of the year.
- Hasbro Interactive was third with a 12.5% of unit sale share and 12.3% revenue share. It had the No. 1 selling game with RollerCoaster Tycoon and the No. 9 game with Frogger.

SOURCE: PC DATA

Enterprise System Management Software

Enterprise system management software is defined as being software used to manage computing resources for the end user, small business, workgroup, and enterprise. (Software for the network infrastructure isn't included in this category.) The market for enterprise system management software is made up of these segments: change and configuration management, event automation, job scheduling, output management, performance management, problem management, and storage management.

- The revenues for the worldwide enterprise system management software market increased 23% in 1999, which was slightly below the $12 billion mark. IDC estimates the market will increase 117% by 2004 to nearly $26 billion.
- The storage management segment totaled $3.2 billion in 1999. IDC estimates this segment will reach $7.6 billion in 2004.
- The performance management segment exceeded $2.7 billion in 1999. IDC estimates this segment will reach $5.4 billion in 2004.

SOURCE: IDC'S "ENTERPRISE SYSTEM MANAGEMENT SOFTWARE MARKET FORECAST AND ANALYSIS" REPORT

Top Ranking Hits Among Software Sites

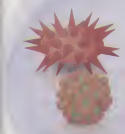
The source for this information is PC Data Online, but it's presented by Top9.com, a division of Omega World Travel. PC Data Online surveys unique users from a panel of more than 120,000 home Internet users.

Below are the nine most popular Web sites (for July 2000) among software companies. The term "unique visitors" is defined as being the number of unduplicated monthly visitors to a site. A unique visitor is counted only one time when compiling results.

List Rank	Overall Web Rank	Software Companies	Unique Visitors (x000)
1	5	microsoft.com	29,567
2	93	macromedia.com	4,979
3	556	netzip.com	1,277
4	727	cometsystems.com	1,018
5	867	winzip.com	891
6	1,521	ascentive.com	546
7	1,709	netmind.com	489
8	2,149	creative.com	395
9	2,241	custhelp.com	381

SOURCE: PC DATA

Are You At Risk?



According to a survey conducted by Central Command, a supplier of antivirus software, that was released in June 2000, many Internet users still aren't addressing online risks. The survey, which was e-mailed to nearly 500,000 PC users and yielded a 16% response rate (with 54,091 responding), covered some common issues.

- 24% of respondents said they do not update their antivirus software at least monthly.
- In the previous 12 months, 62% of the respondents had experienced at least one virus, with 57% resulting in a loss of at least some data. 22% said they lost moderate or large amounts of data.
- 14% of respondents reported more than five virus attacks in a year.
- 80.5% of respondents said they don't have encryption software installed on their PC, and 99.33% said they don't intend on installing such a program.

SOURCE: CENTRAL COMMAND

The Biggest Retail Winners

Gaming & The Internet Influence Sales The Most

It's probably a safe bet that when the early pioneers of the computer first began to envision the profound ways in which such a machine could serve the world, they never dreamed such a huge mass of society would sit in front of such a sophisticated device to play games. But not only are present-day users playing games by the millions, they are also buying them by the millions, thus propelling the gaming software segment to become one of the most lucrative and fastest growing.

According to an Interactive Digital Software Association (IDSA) survey of 900 homes, 60%, or three in five Americans ages six or older, routinely play computer or video games. That equals about 145 million people. It's easy to deduce that with that many people playing games, there are a lot of games being sold. According to PC Data, in June 2000 alone, nearly 5.2 million retail units were sold in the United States, totaling about $121 million in revenues. In 1999, eight of the top 20 selling titles were games. And according to PC Data, PC game sales have been the "linchpin" for an otherwise slow retail software market through most of 2000.

Leading the gaming success has been Diablo II from Havas Interactive, the top selling title for any U.S. retail category for July 2000, according to PC Data. Diablo II reportedly sold more than 266,000 units during a one-month time span after its release in the summer of 2000. Another top selling game throughout 2000 has been The Sims from Electronic Arts, which sold 215,000 copies and generated $8.6 million in revenues in just three weeks during the spring of 2000, according to PC Data. A third huge seller this year and in 1999 is Disney Interactive's Who Wants To Be A Millionaire, the third best selling game of 1999 despite being released in November, and the 11th top seller among all categories in 1999.

To demonstrate how a hot-selling game can impact a company, consider that Electronic Arts' revenues for April 2000 increased $10 million over April 1999, and Disney Interactive's revenues jumped $3.5 million for the same time period, according to PC Data. In June 2000, Diablo II sold approximately 185,000 units for about $9.9 million. Who Wants To Be A Millionaire, 2nd Edition, sold approximately 158,000 units for about $2.9 million. The Sims sold about 154,000 units for $6.7 million.

When considering software titles outside of the gaming market, Intuit ruled PC Data's list of top retail sellers for 1999. The company's TurboTax was the best selling title among all categories, and its TurboTax Deluxe was second. After Norton AntiVirus 5.0 from Symantec and Windows 98 Second Edition from Microsoft, Intuit's Quicken Deluxe was the fifth top seller and Quicken was seventh. Intuit's QuickBooks Pro 99 finished in the 18th position, giving the company five of the top 20 sellers. Microsoft also had five top 20 finishers among all categories with its Win98 upgrades, Encarta Encyclopedia, Age of Empires II: Age of Kings, and Flight Simulator.

Microsoft also had two of the more significant title releases in the past year with the release of its new OSes (operating systems): Windows 2000 and Windows Millennium Edition (WinMe). Win2000 was released Feb. 17, 2000, to much hoopla. The long-awaited OS specifically targets high-end computers and businesses, and it gives Microsoft some powerful ammunition toward grabbing a larger slice of the high-end server market. Microsoft is said to have spent anywhere from $1 billion to $2 billion developing the OS over a four-year period. Sales by June 30 were expected to exceed 3 million licensed copies, according to the company.

On Sept. 14, 2000, Microsoft officially introduced WinMe, although some manufacturers were shipping systems with the consumer-oriented OS in August. The consensus among industry experts seems to be that WinMe won't have the same type of impact that the releases of Win95 and Win98 did, but it should still make a substantial impact in the market.

PC Data senior analyst Steve Koenig says WinMe may not receive the same amount of attention as previous Microsoft OSes, but there will still be plenty of loyal users who will eagerly make the transition from older OSes.

"I think you could see some midnight-madness type of sales at retailers," Koenig says. "A certain group of people want to be the first to get it on their computer. Retailers are going to do anything they can do to get them in stores. E-retailers and brick-and-mortars will probably be promoting it like crazy."

Do You Know...

which software company's titles made up one-fourth of PC Data's Hits List of Top Selling Software for 1999?

Actually, two companies share that distinction. Microsoft had five of the 20 best-selling titles, including Windows 98 Upgrade Second Edition, Windows 98 Upgrade, Encarta, Age of Empires II: Age of Kings, and Flight Simulator. The other company was Intuit, which also had five titles in the top 20, including Turbo Tax, Turbo Tax Deluxe, Quicken Deluxe, Quicken, and QuickBooks Pro 99.

Just the Facts!

Even with 1GHz (gigahertz) systems available, the average system requirements for Microsoft games include a 133MHz Pentium processor, 16MB of RAM, 60MB to 200MB of available hard drive space, a CD-ROM drive, Windows 95/98, a VGA (Video Graphics Array) monitor, and a mouse.

Although Apple's OS X operating system hasn't garnered quite the fanfare and publicity as Win2000 or WinMe, the beta version of Apple's most ambitious OS in more than a decade still made headlines in September 2000 when Steve Jobs, chief executive officer, introduced it at an Apple Expo 2000 conference in Paris. OS X is reportedly influenced by the Unix OS and requires a minimum of 128MB (megabytes) of system memory. Geared toward high-end users, the beta version of OS X will reportedly sell for around $30.

The Linux OS is another OS that continues to gain attention and momentum throughout 1999 and 2000. According to U.S. retail unit sales figures from PC Data, the top publishers for Linux from January through June 2000 were Red Hat with about 95,000 units sold, Linux-Mandrake with 55,000 units, and Corel with 35,000. For 1999, Linux retail sales in the U.S. totaled about $8.8 million, according to PC Data.

A snapshot of sales of OSes for June 2000 shows Microsoft dominating the market segment with its Win98 SE upgrade selling nearly 83,000 retail units for $7.3 million. Red Hat's Linux 6.2 was the fourth top seller with about 12,600 copies for $342,500.

For antivirus titles, Norton AntiVirus 2000 6.0 sold 135,713 units for about $4.1 million, while VirusScan 5.0 sold 47,223 units for almost $1.2 million. For voice recognition software unit sales, Voice Xpress Pro 4.0 from Lernout & Hauspie sold 5,916 units for approximately $300,000, and Dragon Naturally Speaking 4.0 sold nearly 4,400 units for $371,900. For finance titles, Intuit held the top four spots with its QuickBooks and Quicken titles, roughly selling a combined 114,000 units for about $11.5 million.

A look at other title categories using a June 2000 report from PC Data Online shows Microsoft Word is the most used word processor with a 50% user rate among PC users. Along the same lines, Quicken is the top personal finance software title with a 7.6% user rate; Excel is the top spreadsheet application at 17.6%; McAfee VirusShield is the top antivirus title with a 32.9% user rate; and WinZip is the most used zip utility brand with a 21.1% user rate.

Three of the fastest growing areas within the consumer software market include music-sharing applications, streaming media players, and instant messaging. Music-sharing programs, such as Napster, have attractive legions of users, but also draw the ire of the music recording industry. Napster is currently embroiled in a lawsuit with the RIAA (Recording Industry of America

"Today, record labels are sounding a lot like software companies did 10 years ago: 'Pirates ho!' "

Codie Award Winners

Literally dozens of "best" lists are generated around the end of each year by a wide variety of publications and organizations recognizing the top products in scads of technological categories, including software. One of the most prestigious awards given out annually that is specifically related to the software industry is the Codie Award, which is presented by the Software & Information Industry Association (SIIA).

The 2000 Codie Award winners will be announced March 21st in San Diego at the SIIA's spring conference. The event will mark the 15th anniversary for the awards. Winners are selected from groups of nominees judged by a collection of software trade journalists, national technology writers, teachers, and state technology education specialists. Typically, four or five final nominees are chosen in each category for recognition.

For 1999, Codie Award winners in various categories included:

- **Best Business Software Upgrade:** Act 4.0 from Symantec
- **Best Consumer Software Upgrade:** Quicken Deluxe 99 from Intuit
- **Best Debut of the Year:** The Ultimate Cookbook from DinnerWare Publishing
- **Best Desktop Publishing Program or Tool:** Photoshop 5.0 from Adobe
- **Best Education Software Upgrade:** Britannica CD-ROM 98 Multimedia Edition from Encyclopedia Britannica
- **Best Internet Commerce Software:** ecBuilder from Multiactive Software
- **Best Network Security Product:** RealSecure 2.5 from Internet Security Systems
- **Best New Business Software:** Peachtree Office Accounting from Peachtree Software
- **Best New Consumer Software Program:** Robotics Invention System from LEGO Mindstorms
- **Best New Education Software Program:** A World of Learning: The Complete National Geographic Curriculum Supplement from TLC School
- **Best New Home Creativity Software Program:** LEGO Creator from LEGO Media International
- **Best Overall Multimedia Production:** Encyclopedia Britannica CD 99 Multimedia Edition from Encyclopedia Britannica
- **Best New Personal Productivity Software:** 3-D Home Design Suite from Broderbund Software
- **Best New Software Program of the Year and Best Reference Product:** National Geographic Maps from Mindscape
- **Best Numeric or Data Business Software Program:** QuickBooks Pro 6.0 from Intuit
- **Best Travel Software or Services:** TripMaker Deluxe 1999 Edition from Rand McNally
- **Best Utility Software Program:** PartitionMagic 4.0 from PowerQuest

In addition to the Codie Awards, the SIIA also recognizes Lifetime Achievement Award winners. During the past 10 years, winners have included Paul Allen and Bill Gates, founders of Microsoft; Steve Jobs and Steve Wozniak, founders of Apple Computers; Grace Hopper, credited as being the first lady of software; and Alan Key, designer of Smalltalk, the first completely object-oriented programming language.

Dates To Remember

On Nov. 20, 1985, Microsoft began selling the Windows operating system. Based on DOS, Windows allowed users to have multiple programs open at once.

Association), which says Napster violated copyright laws by enabling the copying and distribution of copyrighted music by its users.

That hasn't slowed Napster's popularity. The company claims 20 million users. Media Metrix says visitors to Napster's Web site grew a whopping 345% from February to July 2000, and it is the fastest growing application it has ever tracked. In September, Napster ranked as the 43rd most popular home application based on an estimated 6% installation rate of U.S. home PCs with a modem.

Like Napster, streaming media players that allow users to access audio and video from the Internet are growing rapidly. According to PC Data Online and its data gathered from about 120,000 users, nearly 79% of U.S. home Internet users have a streaming media application installed, with RealPlayer from RealNetworks owning an 80.8% usage share among those specific users, and Microsoft's Windows Media Player having a 55.3% share.

"Streaming media players are hot in software," Koenig says. "There's basically a steel cage match going on between RealNetworks and Microsoft. Those two are really battling it out. That's going to be an increasingly important and hot area."

Instant messaging is also hot, Koenig says. PC Data Online reports 60.4% of home Internet users have an instant messaging application installed. Of that percentage, almost 63% have America Online Instant Messenger installed, 31% have ICQ installed, and 30.7% have MSN Messenger Service.

"Instant messaging is a faster and more direct way to communicate with someone

Windows Me & Windows 2000

If there was one software frontier Microsoft had yet to fully gain a strong foothold in before 2000, it may have been in the arena of high-end computers, such as servers, which has been dominated by the Unix operating system and companies such as Sun Microsystems and Novell. In mid-February 2000, however, Microsoft took a major step at gaining a larger segment of that market with the release of Windows 2000, easily one of the most anticipated software releases of the year.

Microsoft Chairman Bill Gates stated at the time of Win2000's release that it was the most ambitious project the company has ever tackled. Numbers generated from Win2000 go a long way to support that claim. Microsoft reportedly spent anywhere from $1 billion to $2 billion developing Win2000 over a period of about four years. In addition, between 4,000 and 5,000 employees were reportedly involved in the development, and nearly 1 million beta testers were used.

In June, Microsoft reported that sales for Win2000 were expected to exceed 3 million licensed copies by June 30. In addition, Microsoft stated that independent testing company VeriTest has approved at least 100 "Certified for Windows" applications and 300 more applications were under review. Microsoft also stated a reported 266,000 IT (information technology) professionals have been trained on the platform as part of a $40 million training initiative.

Upon its release, the operating system was presented in three versions, including a Professional version for desktop computers and notebooks, a Server version for low-end servers, and an Advanced Server version for high-end machines. A Datacenter version was released several months later to manufacturers for extremely powerful systems with support for up to 32 processors.

Steve Koenig, a senior analyst for PC Data, says sales of Win2000 have held steady since its release. Sales might be significantly aided with the release of the Windows Millennium Edition (WinMe), a consumer-oriented OS (operating system) released on Sept. 14, 2000.

"Windows 2000's done OK," Koenig says. "I expect it to gain momentum. I think Windows Me will help it garner some more attention. The sales have been solid for it, though."

While the anticipation and hype of Win2000's release were enormous, the release of WinMe has been generally greeted by industry insiders with less fanfare and excitement. For the most part, WinMe is being seen more as an enhancement of the Windows 98 Second Edition OS, containing new error recovery, file protection, and multimedia features, plus better capabilities for home networks. Microsoft says WinMe will be the last OS to use DOS as its foundation. WinMe's successor, reportedly code-named "Whistler," is expected for release sometime in 2001.

Koenig says it's too early to tell if WinMe will have the impact that Win95 and Win98 did on consumers and the market as a whole. He says WinMe doesn't appear to have the same revolutionary feel that those previous OSes had.

"I would say that it may not make as big of a splash as Windows 98," Koenig says. "When the launch happens, you'll have a better idea of how it will stack up with Windows 98. That was obviously a big one, and Windows 95 was the Super Nova. I will say it will definitely be a big hit, though."

Koenig says the relatively short time period between the releases of WinMe and Win2000 might confuse some consumers and initially hamper the sales of WinMe.

"It's too soon to tell if [Windows Me] will surpass Windows 98, but my gut feeling is it won't because Windows 2000 is already out there," Koenig says. "They've kind of split their thunder up with the release of 2000 and then turning around and releasing Me."

WinMe is expected to cost $209 for a fully installed version. An upgrade from Win98 or Win98 SE is anticipated to cost $59, while an upgrade from Win95 is expected to cost $109. □

They Said It...

"It's 30 years in the future. We'll be out of office. Leave it to the civil servants. They'll still be here."

-Edward David, science adviser to President Nixon, on how White House officials then reacted to his warnings about possible Y2K computer problems, The Washington Post, *July 19, 1999.*

online than e-mail," Koenig says. "It's like an instant chat window you can open up with somebody."

Other notable recent releases include new browser versions for Netscape Navigator and Microsoft Internet Explorer; Microsoft Office 2000 and Encarta 2000; Intuit Quicken Deluxe 2000 and 2001; Adobe Photoshop 5.5 and PhotoDeluxe; and Peachtree Complete Accounting.

Based on sales, revenues, and user patterns, it's clear that the Internet is having a direct impact on the software industry. The Internet will also continue to have an indirect influence on the industry, such as when users purchase more antivirus software titles to protect their data from potentially damaging downloads, e-mail, and hackers. RS

by Blaine Flamig

Music-Sharing Dilemmas

Few topics caused as much commotion and etched such strong opinions on all fronts during the past year than downloading and exchanging copyrighted MP3 files from the Internet. Most of the attention paid to such programs and exchange services as Napster, MP3.com, and Scour Exchange evolved from various lawsuits, appeals, and court rulings filed against them.

In early September 2000, federal Judge Jed Rakoff ruled MP3.com violated copyright laws and must pay Universal Music Group $25,000 for each CD it copied from Universal's catalog. The judgment could cost MP3.com more than $118 million, depending on the number of CDs Rakoff determines MP3.com copied. Universal says as many as 10,000 CDs were copied.

Also in September, the exchange service Scour reportedly laid off 52 employees due, in part, to lawsuits it faces from entertainment groups claiming Scour violated copyright laws with its Scour Exchange service, which helps users search for, share, and download multimedia files.

Perhaps no company generated as much controversy and discussion concerning file sharing as Napster, which essentially acts as a middleman between Napster's reported 20 million users for exchanging and downloading MP3 music files. Napster became so high in profile partly because of lawsuits filed against it by the RIAA (Recording Industry Association of America), heavy-metal band Metallica, and rapper Dr. Dre.

Metallica's suit, filed in April 2000, claims that Napster aided in the illegal exchange of Metallica's copyrighted music. In May, Metallica supplied Napster with a list of about 320,000 names that allegedly used Napster to distribute Metallica's music illegally. Napster ended the services of those users, but many reportedly later registered for the service under a different username.

In July, federal Judge Marilyn Hall Patel ordered Napster to stop enabling the exchange of copyrighted music, essentially shutting Napster down. The 9th Circuit Court of Appeals granted Napster a reprieve and is expected to hear an appeal in October.

With so much at stake for all parties, it's easy to understand the strong opinions being forged. The following statistics from various sources offer insight into public opinion and more.

- According to an April 2000 release, data gathered by PC Data from about 30,000 U.S. homes indicates 15% of those surveyed used Napster during the previous month, with the 10% most frequent Napster users accounting for nearly 40% of all Napster traffic.
- A PC Data Online poll from June 2000 of 1,560 home Internet users shows only 16% agree with the RIAA that Napster violated copyright laws. Another 45% disagree and 39% have no opinion. More than 57% believe the RIAA defense is admirable but unrealistic; 50% disagree that acquiring free music from the Internet is piracy; and 23% say it's illegal. Also, 25% say they will continue to use exchange services even if courts rule it's a copyright infringement; and 60% say Napster actually helps the recording industry.
- In a February 2000 Gartner Group survey of 40,000 U.S. households, MP3 users purchased an average of three more CDs in a six-month period than non-MP3 users. In addition, 58% of MP3 users are still making in-store CD purchases, compared to 50% of the general public.
- According to a May 2000 Greenfield Online study of 1,135 college students, 58% have used Napster, but 79% were still buying music. Two-thirds say they download music so they can preview it before buying a CD. In addition, 73% indicate they download music; 72% download music to listen to it directly from their computer; 44% download music because they say CDs cost too much; and 35% create customized CDs with downloaded music.
- In an April 2000 Angus Reid survey of 1,000 U.S. adults, 10% downloaded music from the Internet in the previous two months, with 6% having used Napster. In addition, 54% say downloading copyrighted music for free is morally wrong; 54% say Napster should be forced to stop enabling the copying and swapping of MP3 files; and of those who have downloaded MP3 files, 52% say they would pay a small fee per song.

The Highest Retail Sales

Top Selling Software For 1999

Rank	Title	Publisher	Average Price
1	TurboTax	Intuit	$20
2	TurboTax Deluxe	Intuit	$28
3	Norton AntiVirus 5.0	Symantec	$18
4	Windows 98 Upgrade Second Edition	Microsoft	$89
5	Quicken Deluxe	Intuit	$55
6	MP RollerCoaster Tycoon	Hasbro Interactive	$28
7	Quicken	Intuit	$30
8	Windows 98 Upgrade	Microsoft	$86
9	VirusScan 4.5 Classic	Network Associates	$19
10	SimCity 3000	Electronic Arts	$42
11	Who Wants To Be A Millionaire	Disney	$19
12	TaxCut 1998 Deluxe Filing Edition	Block Financial	$16
13	Encarta Encyclopedia	Microsoft	$26
14	Age of Empires II: Age of Kings	Microsoft	$43

PC Data

Office 2000

- Microsoft's Office 2000 generated $8.8 million in its first week of sales in the retail and mail order markets in early June 1999.
- That was better than any first week performance since the Windows 98 upgrade a year earlier.
- Sales of Office 2000 accounted for 16.5% of total retail software that week and boosted retail software sales revenue by more than 25% compared to the previous week.
- Office 2000 represented a 26.9% boost to retail software sales revenue.

Source: PC Data, June 1999 release

Windows 2000 Sales

According to Microsoft:

- Licensed sales of Windows 2000 were expected to surpass the 3-million mark by June 2000.
- More than 266,000 IT professionals have been trained on Windows 2000 by June 2000.
- More than 100 applications have been "Certified for Windows" by VeriTest, an independent testing agency.

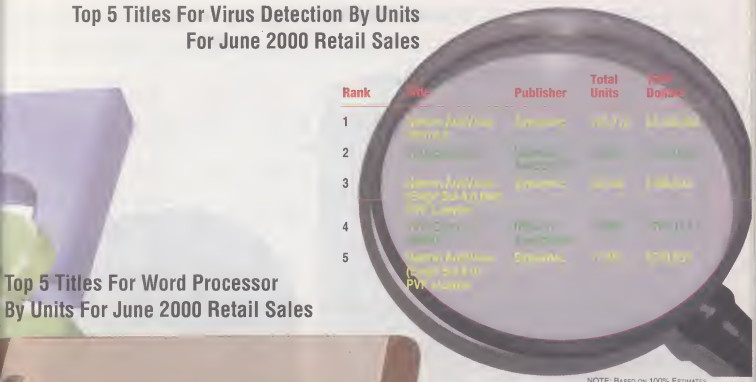
Source: Microsoft

Top-Selling Personal Productivity Software For 1999

Rank	Title	Publisher	Average Price
1	TurboTax	Intuit	$20
2	TurboTax Deluxe	Intuit	$28
3	Quicken Deluxe	Intuit	$55
4	Quicken	Intuit	$30
5	TaxCut 1998 Deluxe Filing Edition	Block Financial	$16
6	Print Shop 6.0 Deluxe	Mattel Interactive	$22
7	TurboTax 30 State	Intuit	$28
8	Print Shop 6.0	Mattel Interactive	$18
9	American Greetings CreataCard Plus 3	Mattel Interactive	$20
10	Money	Microsoft	$20

Source: PC Data

Top 5 Titles For Virus Detection By Units For June 2000 Retail Sales



Rank	Title	Publisher	Total Units	Total Dollars
1				
2				
3				
4				
5				

NOTE: Based on 100% Estimates

Source: PC Data

Top 5 Titles For Word Processor By Units For June 2000 Retail Sales

Rank	Title	Publisher	Total Units	Total Dollars
1	Word Comp Upgrade Version	Microsoft	5,775	$472,024
2	Word for iMac Promo	Microsoft	1,370	$166,352
3	Word	Microsoft	1,075	$261,910
4	Corel WordPerfect 8.x Personal Edition	Corel	493	$8,020
5	Corel WordPerfect 2000 CLPChoice License Upgrade	Corel	386	$31,884

NOTE: Based on 100% Estimates

Source: PC Data

Top Web Sites For Software Retailers

The source for this information is PC Data Online and is presented by Top9.com, a division of Omega World Travel. PC Data Online surveys unique users from a panel of more than 120,000 home Internet users.

These represent the nine most popular Web sites for software companies in July 2000. Unique visitors is defined as being the number of unduplicated monthly visitors to a site. A unique user is counted only one time.

Last Rank	Overall Web Rank	Software Retailers	Unique Visitors (000)
	575	sierra.com	1,247
	806	beyond.com	875
	2,096	symantecstore.com	405
	2,845	unbeatabledeals.com	363
	3,880	palmgear.com	232
	5,331	cdrom.com	158
	5,674	tzo.com	147
	7,393	999central.com	113
	7,894	softwarebuys.com	105

Source: PC Data Online

Top 5 Titles For Relational Database By Units For June 2000 Retail Sales

Rank	Title	Publisher	Total Units	Total Dollars
1	SQL 7.0 Clnt Acc OPEN License	Microsoft	7,628	$851 166
2	Access Upgrade	Microsoft	5,449	$537,924
3	Filemaker Pro 5.0	Filemaker, Inc.	2,981	$695,566
4	Filemaker Pro 5.0 Upgrade	Filemaker, Inc.	2,429	$332,576
5	SQL 7.0 Clnt Acc OPEN License Comp Upgrade	Microsoft	2,138	$120,433

NOTE: Based on 100% Estimates

Top 5 Titles For System Utilities By Units For June 2000 Retail Sales

Rank	Title	Publisher	Total Units	Total Dollars
1	Norton AntiVirus 2000 6.0	Symantec	135,713	$4,056,365
2	Norton SystemWorks 2000 4.0	Symantec	61,279	$3,265,066
3	VirusScan 5.0	Network Associates	47,223	$1,240,642
4	Norton AntiVirus (Entpr Sol 4.0 Mem PVP License	Symantec	36,548	$466,893
5	VirusScan 5.0 Deluxe	Network Associates	18,888	$740,114

NOTE: Based on 100% Estimates

Top 5 Titles For Voice Recognition By Units For June 2000 Retail Sales

Rank	Title	Publisher	Total Units	Total Dollars
1	Voice XPress Pro 4.0	Lernout & Hauspie	5,916	$296,808
2	Dragon Naturally Speaking 4.0	Dragon Systems	4,384	$371,884
3	Dragon Naturally Speaking Essentials 4.0	Dragon Systems	3,735	$201,397
4	Voice Xpress 5.0	Lernout & Hauspie	3,469	$160,473
5	Dragon Naturally Speaking Pref 4.0	Dragon Systems	3,448	$520,064

NOTE: Based on 100% Estimates

Top 5 Titles For Suite Bundle By Units For June 2000 Retail Sales

Rank	Title	Publisher	Total Units	Total Dollars
1	Office 2000 Comp/Version Upgrade	Microsoft	20,170	$4,310,188
2	Office 2000 Professional Comp/Version Upgrade	Microsoft	16,161	$4,956,246
3	Office 2000 Professional OPEN License	Microsoft	13,760	$5,390,517
4	Office 2000 Professional OPEN License Acad	Microsoft	10,589	$563,669
5	Office 2000 OPEN License	Microsoft	9,356	$3,090,979

NOTE: BASED ON 100% ESTIMATES

Top 10 Titles For Operating System By Units For June 2000 Retail Sales

Rank	Title	Publisher	Total Units	Total Dollars
1	Windows 98 Second Edition Upgrade	Microsoft	82,729	$7,282,817
2	Windows 98 Second Edition	Microsoft	21,508	$3,506,297
3	Windows 2000 Server/Client Acc OPEN License	Microsoft	18,150	$498,606
4	Linux 6.2	Red Hat	12,585	$342,490
5	Windows 2000 Professional Upgrade	Microsoft	12,153	$2,289,883
6	Windows 2000 Server/Client Acc OPEN License Comp Upgrade	Microsoft	11,884	$170,618
7	Complete Linux 7.0	Linux-Mandrake/ Macmillan	10,763	$269,807
8	Mac OS 9.0	Apple Computer	10,364	$981,296
9	Windows 2000 Server/Client Acc OPEN License Acad	Microsoft	9,410	$55,606
10	Windows 2000 Professional OPEN License Upgrade	Microsoft	7,945	$1,118,617

NOTE: BASED ON 100% ESTIMATES

Top 5 Titles For Spreadsheets By Units For June 2000 Retail Sales

Rank	Title	Publisher	Total Units	Total Dollars
1	Excel Comp/Version Upgrade	Microsoft	4,066	$402,934
2	Excel	Microsoft	754	$223,435
3	Lotus 1-2-3 Millennium Edition Upgrade	Lotus	426	$42,063
4	Lotus 1-2-3 Mnt VPO License	Lotus	353	$18,053
5	Excel OPEN License Upgrade	Microsoft	206	$16,239

NOTE: BASED ON 100% ESTIMATES

SOURCE FOR ALL STATISTICAL INFORMATION ON THIS PAGE AND THE PRECEDING PAGE: PC DATA

Top-Selling Games For 1999

Rank	Title	Publisher	Average Price
1	MP RollerCoaster Tycoon	Hasbro Interactive	$28
2	SimCity 3000	Electronic Arts	$42
3	Who Wants To Be A Millionaire	Disney	$19
4	Age of Empires II: Age of Kings	Microsoft	$43
5	StarCraft	Havas Interactive	$28
6	Half-Life	Havas Interactive	$32
7	Command & Conquer 2: Tiberian Sun	Electronic Arts	$40
8	Flight Simulator	Microsoft	$43
9	Frogger	Hasbro Interactive	$19
10	Baldur's Gate	Interplay	$39
11	Cabela's Big Game Hunter 2	Activision	$16
12	Wheel of Fortune	Hasbro Interactive	$28
13	Tom Clancy's Rainbow Six Gold Edition	Red Storm Entertainment	$28
14	StarCraft Expansion: Brood War	Havas Interactive	$19
15	Need For Speed 3	Electronic Arts	$20

Top-Selling Consumer Software (Macintosh Only) For 1999

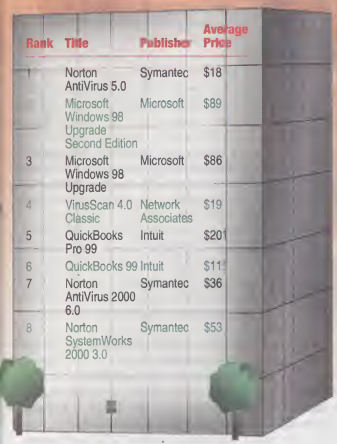
Rank	Title	Publisher	Average Price
1	Mac OS 8.5	Apple	$95
2	Mac OS 9.0	Apple	$94
3	Where In The USA Is Carmen Sandiego Deluxe	Mattel	$28
4	Norton Utilities 4.0	Symantec	$78
5	Norton Utilities 5.0	Symantec	$81

Top-Selling Business Software (Macintosh Only) For 1999

Rank	Title	Publisher	Average Price
1	Mac OS 8.5	Apple	$95
2	Mac OS 9.0	Apple	$94
3	Norton Utilities 4.0	Symantec	$78
4	Norton Utilities 5.0	Symantec	$81
5	Adobe Photoshop 5.5 Upgrade	Adobe	$172

Top-Selling Business Software For 1999

Compiled by Blaine Flamig
Graphics & Design By Andria Schultz & Carrie Benes



Rank	Title	Publisher	Average Price
1	Norton AntiVirus 5.0	Symantec	$18
	Microsoft Windows 98 Upgrade Second Edition	Microsoft	$89
3	Microsoft Windows 98 Upgrade	Microsoft	$86
4	VirusScan 4.0 Classic	Network Associates	$19
5	QuickBooks Pro 99	Intuit	$201
6	QuickBooks 99	Intuit	$11
7	Norton AntiVirus 2000 6.0	Symantec	$36
8	Norton SystemWorks 2000 3.0	Symantec	$53

Top-Selling Reference Software For 1999

Rank	Title	Publisher	Price
1	Encarta Encyclopedia	Microsoft	$26
2	World Book Millennium 2000	IBM	$31
3	Compton's Interactive Encyclopedia 99 Deluxe	Mattel	$19
4	Encarta Encyclopedia Deluxe	Microsoft	$51
5	World Book Encyclopedia Standard 99	IBM	$18

Top-Selling Home Education Software For 1999

Rank	Title	Publisher	Average Price
1	Pokemon Studio Blue	Mattel Interactive	$20
2	JumpStart 1st Grade	Havas Interactive	$21
3	Blue's ABC Time Activities	Humongous (GT Interactive)	$20
4	Pokemon Studio Red	Mattel Interactive	$20
5	JumpStart 2nd Grade	Havas Interactive	$20
6	JumpStart Preschool	Havas Interactive	$20
7	JumpStart 3rd Grade	Havas Interactive	$20
8	Rugrats Movie Activity Challenge	Mattel Interactive	$29
9	JumpStart Kindergarten II	Havas Interactive	$20
10	Blue's Birthday Adventure	Humongous (GT Interactive)	$20

SOURCE FOR ALL STATISTICAL INFORMATION ON THIS PAGE AND THE PRECEDING PAGE: PC DATA

Software Terms

automated reasoning—Sometimes called "mechanized reasoning," automated reasoning refers to a software program designed to draw its own conclusions and execute new instructions based solely on those conclusions, with no human direction or intervention required. While such programs have traditionally been used to prove mathematical theorems, new advances in artificial intelligence and other technologies have given automated reasoning applications new purposes. Examples include programs from Reasoning Inc. that automatically check software for flaws that could cause application failures and crashes.

DEN (directory enabled networks)—An open standard allowing a single network application to work with different network and directory products and services. The DEN specification, initiated by Microsoft and Cisco, is an object-oriented model that represents separate network elements and services in a directory. This method, which uses LDAP (Lightweight Directory Access Protocol), is designed to simplify and automate managing tasks for large enterprise networks and enhance security.

digital geometry compression—A new compression technology from Bell Labs designed to efficiently transmit 3-D data via the Internet. Gathered by a 3-D laser scanning technique, an image is broken down into digital geometric data represented by millions (or billions) of extremely tiny triangles. Compressing these data triangles could eventually be 12 times more efficient than current MPEG-4 (Moving Pictures Experts Group-4) compression methods. Digital geometry compression could have applications in various high-end 3-D applications in the medical, entertainment,. manufacturing, and education fields.

DSML (Directory Services Markup Language)—A language developed to streamline the process of exchanging data among different directory systems that use XML (Extensible Markup Language). Without such a unifying standard, companies using different network directory systems would first have to use a special program to convert shared information in order to use the data. DSML is viewed by many in the industry as an important step toward simplifying the process of business-to-business data sharing and other e-commerce tasks.

evolutionary computing—A computer model that uses biology and natural selection as key elements in the application's design and implementation. Evolutionary computing, including neural networks and genetic algorithms, are designed primarily to find variable relationships that human observers might miss. Recent applications for evolutionary computer models include determining design improvements for hardware and architectural structures, as well as streamlining manufacturing processes.

genetic algorithm—A form of evolutionary computation designed to create adaptive strategies and improve procedural efficiency. These algorithms are comprised of "individuals," or possible solutions for a given task. Each individual contains a set of character strings, which are "chromosomes" grouped together to form populations. When a user runs a genetic algorithm, each individual in a given population runs through a simulated evolution of variables to arrive at a single solution. Applications for genetic algorithm programs include load balancing for manufacturing environments containing multiple variables, such as time, temperature, and tracking needs.

GNOME (GNU Network Object Model Environment)—Part of the GNU (GNU is Not Unix) project for creating useful, free software, GNOME focuses on making programs for modern Unix-based systems, including Linux, available to the public at no cost. In addition to the Linux operating system, GNOME also provides tools, libraries, and productivity applications to users.

J2EE (Java 2, Enterprise Edition)—An application developed by Sun Microsystems that tries to simplify the development of multi-tiered, Web-based enterprise programs. J2EE uses Sun's JavaBeans and JavaServerPages technologies for program development and supports XML (Extensible Markup Language) standards.

JavaBeans—Small, reusable software components, such as a button, dialog box, or scroll bar, created by Sun Microsystems for easy visual manipulation using Visual Basic or another Web site creation tool. Programmers can custom design a Java bean to suit individual tastes in a Java-based application or even construct a "connection" between Java and other programs, such as ActiveX. Beans differ from regular Java class files in that they can be manipulated while they are being assembled as part of a larger application.

Linux—A Unix-based, open-source operating system created by Linus Torvalds in 1991.

Considered by many to be a stable, low-cost alternative to Windows, Linux continues to gain increasing popularity for networking, software development, and end-user platform applications. Full-featured Linux versions are now available and programmers from around the world continue to improve upon and embellish the operating system with their own additions.

Love bug—The fastest-spreading computer virus to date. The Love bug appeared in the spring of 2000 and infected millions of computers around the world, in part because of the appealing "ILOVEYOU" subject line and attachment in many of the messages. Then, when a user opened the ILOVEYOU attachment, the virus tried to send the same attachment to everyone in that person's e-mail address book. Believed to have originated in the Philippines, the Love bug virus spread through e-mail messages and Internet chat rooms. Once loaded onto a computer, the worm targeted numerous file types, including those with .JPEG, .TXT, .GIF, .DOC, and .HTML extensions, and replaced the contents with the virus's own source code.

Macster—A program that allows Macintosh computer users access to the file-sharing services offered within the Napster community.

MathML (Mathematical Markup Language)—An XML-based (Extensible Markup Language) application that allows mathematical notation, structure, and content to be displayed, received, and processed on the Web, much as text currently is with HTML (Hypertext Markup Language).

metadirectories—A product or service designed to streamline the process of accessing many different directories while simplifying directory management and eliminating security holes. For example, a metadirectory could synchronize hundreds of a company's different product and service directories to provide seamless access for a user or administrator.

multiagent system—A loose network of individual software agents (programs that work in the background to automatically perform user-requested tasks, such as finding specific information). By distributing capabilities, resources, and tasks across the network, multi agent systems can work together to solve problems too large for any single software agent.

nanojet—The term for an extremely small jet nozzle (about one-thousandth the width of a piece of hair) that can stream out microscopic material onto silicon surfaces or clean impurities or errors off of microchips. Research is currently being conducted at universities around the world to expand upon and perfect various nanojet applications, such as atomic etching.

Napster—A term used to describe a specific brand of file-sharing software that lets users locate and share MP3 files from one computer interface. Napster operates on Windows 95, 98, 2000, and NT systems. A Macintosh-compatible software version is expected soon. Napster is currently dealing with litigation from various record labels and artists, who claim that the company's file-sharing software violates copyright infringement laws.

Pretty Park worm—A worm discovered in February 2000 that infects Windows 95, 98, and NT systems. Pretty Park arrives as an e-mail attachment, and once activated, the worm will make changes to the user's system Registry, allowing the infecting agent to load each time a user begins a Windows session. Pretty Park will then try to e-mail itself every half hour to all e-mail addresses listed in the user's Outlook Express address book and connect to an IRC server in an effort to send passwords and other user information back to the worm's author.

Scour—A software sharing program similar to Napster, but it lets users share music, video, and picture files via the Internet. Using the Scour software, for example, helps visitors to Scour's Web site locate broadcast radio stations, view sports video clips, and exchange MP3 files.

SOAP (Simple Object Access Protocol)—An XML-based (Extensible Markup Language) protocol created by Microsoft. A platform-independent specification for devices using XML and HTTP (Hypertext Transfer Protocol) to access information, SOAP standardizes the data transmission process among competing technologies and aspires to increase interoperability.

Stages worm—A virus that spread among computer systems rapidly in the summer of 2000. The Stages worm arrived as an attachment to an e-mail that included subject lines such as "Life Stages," "Funny," and "FW: Jokes text." Once a user opened the attachment, the Stages virus loaded onto the system and displayed a list of amusing anecdotes. After that, the worm then altered the user's system Registry, created files with random names throughout the computer's directories, and sent itself as an e-mail attachment to various recipients in the infected user's Outlook address book. Aliases for the Stages worm include Scrapworm, IRC/Stages.ini, ShellScrap worm, VBS/LifeStages.

telerobotics—The technology that lets humans control objects in a location or of a size that would make in-person manipulation difficult or impossible. Examples of telerobotic applications include controlling robots through hazardous sections of a nuclear power plant or space station. Telerobotics can also be used for some surgery techniques or when working with very small objects. Such machines are controlled via the Internet or another type of connection.

Windows Millennium Edition (Windows Me or WinMe)—The name of Microsoft's newest operating system designed specifically for home users. This new platform, released in 2000, expands on Windows 98's multimedia, Internet, and operating system health and repair capabilities and offers home networking features.

Wrapster—The name of a file-sharing program similar to the Napster application. Using Wrapster to archive a video, music, or image file, users can search for and share movies, albums, images, and other items via the Napster network.

XML-RPC (Extensible Markup Language-Remote Procedure Call)—A cross-platform protocol that lets various software programs using different operating systems and running on different machines transmit, process, and return procedure data via the Internet. The XML-RPC specification uses the Web's HTTP (Hypertext Transfer Protocol) to transmit the procedure data, which is written using XML. This method allows Macintosh programs to communicate with Windows software, for example, or with applications running on Unix systems, mainframe computers, or PDA (personal digital assistant) devices. RS

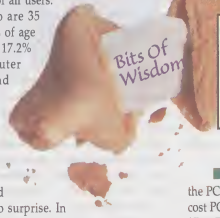
Where In The World Is Hardware Going?

An Atlas Of Technology

We all know the computer industry is a very dynamic place. There's always a new technology, method, or gadget that is guaranteed to be the "Next Big Thing!" Sometimes that's true—think MP3 (MPEG Audio Layer 3) and USB (Universal Serial Bus). Sometimes it isn't, think Free PCs or any number of Internet startups. The notion of the next big thing is a trend that will definitely continue for the foreseeable future, regardless of what happens with the next big things of today, such as Bluetooth (an international standard that lets digital devices communicate with one another using high-frequency, shortwave radio transmitters and receivers), transform and lighting (a technique used by the CPU and graphics chips that processes geometric and mathematical data to produce on-screen images; lighting is also added during the process), and phone lines for home networking (home networking kits that use the existing phone lines to connect the PCs). We'll gaze far into the future (well, the present and near future anyway) and see in what direction computing technology may take us.

■ **Getting To Know You.** Before we delve into the trends that have and will influence the computing industry, let's take a look at the current crop of computer users.

We usually think of computer users as younger adults with good educations and good jobs. The facts tend to bear this out. PC Data recently released a report that notes several characteristics of home PC users who have Internet access. The dominant age group among the surveyed home PC users is 25 to 34-year-olds, who make up 18.1% of all users. Users who are 35 to 44 years of age constitute 17.2% of computer users, and the numbers drop as the age bracket increases, which should come as no surprise. In the 55- to 64-year-old group, only 6.8% of home PC users have Internet access, while only 3.5% of them are over 65.



"Just think: 30 years ago, governments would have gone to war to possess your desktop computer."

Education is believed to be another important indicator of who is more likely to use a home PC, but the PC Data report shows a fairly even distribution of education levels. For example, 18.1% of the home PC users surveyed for the report were high school graduates, while only 19.4% were college graduates. Another 21.3% reported that they had some college experience. Those who attended vocational school accounted for only 1.4% of home computer users with Internet access, however, and 8.1% have advanced degrees.

The bulk of users surveyed have middle-class incomes, as you might expect. Of those responding, 26.9% reported having a household income of $25,000 to $49,999 and 24.1% reported incomes between $50,000 and $74,999, which accounts for 51% of the users surveyed. Users with incomes of less than $25,000 accounted for 17.8% of those surveyed, while users with incomes over $100,000 constituted 16.8% of the total.

These numbers indicate that the PC has become, in fact, a mainstream machine. A few years ago, we thought of a typical home computer user as a well-educated, well-off male computer geek. But due to crashing PC prices combined with the cultural inertia of our fascination with technology, PCs have become welcomed members of most households. A report by the MPAA (Motion Picture Association of America) and the Census Bureau found that more than 61 million households in the United States had a PC by the end of 1999, which accounts for 59% of all homes in the United States.

■ **PCs.** Part of the overall success of the PC market is due to the popularity of low cost PCs, no-frills machines that cost less than $700. The cheap PC market seems to be losing some steam, says Charles Smulders, a principal analyst with Gartner Dataquest. He says, "Part of the problem was that a year ago the introduction of $400 rebates produced a spike in growth by opening up PC technology to lower income households." Which was exactly the point of the cheap PC, of course, but demand for low-cost PCs showed some weakness in the second quarter of 2000 because, as Smulders says, "many of those seats have been filled."

Companies used a variety of hooks last year to attract consumers to their lower-priced PCs. One of the most popular methods used by companies such as Circuit City and CompuServe was the $400 rebate mentioned by Smulders, in which a customer would receive $400 off the price of PC in exchange for signing on with an ISP (Internet service provider) for several years of service. Smulders says this practice is still popular with new buyers, but users who already have an ISP and are looking to simply replace their system are not as inclined to go for the deal.

Free PCs also created a lot of buzz last year, albeit for only a short time. As with the

GUESS WHO?

This British chemical engineer marketed the world's first commercially successful portable computer, which weighed 24 pounds, featured a 5-inch display, and retailed for around $1,800, in 1981. Before that, he wrote instructions for Intel processors.

Answer: Adam Osborne

Dates To Remember

In December 1974, computer manufacturer MITS marketed the Altair 8800 in the magazine Popular Electronics. The Altair was the first machine called a personal computer. It came as a kit with no keyboard, screen, mouse, or programs. It ran on Intel's 8080 microprocessor chip, included 256 bytes of memory, and cost $397.

rebates, users who opted for the plan had to agree to a long-term contract for ISP service. Many observers of the computing industry had little faith in this business model, and it seems they were right. Smulders says, "Economically, free PCs make no business sense today."

Consumers may have been attracted by the $400 rebates and free PC offers, but they are typically not inclined to buy a used or refurbished PC. It's not like trading in a used car, after all. The prices of used PCs are not much less than those of newer, low-cost PCs, and given the speed at which computers become obsolete, it makes more sense to buy a new one, rather than spend several hundred dollars on a PC that's either outdated or probably will be soon.

■ **Portables & PDAs.** Corporate IS (Information System) buyers aren't fond of spending money on outdated technologies either, although they're also not inclined to jump at sparkly products with a lot of bells and whistles. Portables are a working person's machine, computers for the traveling man, the guy or gal on the go. These people need to be connected, not tied down. That being the case, Bluetooth is generating a lot of excitement among portable people with its promise to free portables from cables and make transferring data between devices easier than ever.

Michael McGuire, principal analyst for Gartner Dataquest, says that the initial crop of Bluetooth products, which should be available in early 2001 if not sooner, will primarily be snap-on products and accessories. The first Bluetooth notebook products will likely come in the form of PC cards, although Bluetooth technology will soon be incorporated directly into the portables. PDAs will initially use attachments or clip-ons to make them Bluetooth-ready, although they too are expected to incorporate Bluetooth functionality directly in the PDA hardware in the not-so-distant future.

Bluetooth is expected to be a big hit among mobile professionals because of its many benefits and advantages. McGuire says, "Bluetooth is one of those essential technologies for mobile computing devices, because it's very cool, interesting stuff, but it's also very important." The main attraction of Bluetooth is that it should make cables a thing of the past. You won't need to plug your PDA into your portable, or anything else for that matter, in order to transfer data between the two. You can use it to coordinate your contacts and other information among your portable and PDA simply by carrying your PDA into the same room as your laptop.

The same rules will apply to cellular phones equipped with Bluetooth technology.

Of course, exchanging data among your own hardware isn't Bluetooth's only purpose. Let's say you show a 600MB (megabyte) PowerPoint presentation to a client. If you and your client both have notebooks that incorporate Bluetooth technology, you can quickly zap the PowerPoint presentation from your machine directly to his without fiddling around with a handful of Zip disks or other media.

This sort of simplified data exchange should make lives easier for mobile professionals. It should be noted that PDAs are taking on a larger role in the mobile lifestyle as an auxiliary device. However, don't expect the PDA to replace the tried and true portable PC. PDAs may be especially useful for some functions, such as checking e-mail, looking up basic stock news or sports scores, or keeping track of your schedule, but you probably wouldn't want to type an extensive business report on one. That's the portable's territory, and rightfully so.

Having said that, McGuire foresees many users (mobile or otherwise) getting PDAs because they fit their needs. He says, "Can I see out into 2006, PDAs and wireless devices representing more . . . sheer unit numbers? Yeah! I don't think anybody would disagree with that, just because there are going to be more people who might need a handheld or PDA wireless communicator at any given time than somebody who needs a full blown notebook computer."

■ **Graphics Cards.** Now let us make the seamless transition from the stodgy and sullen world of corporate America to the much sexier world of graphics cards. The nature of the graphics card industry is predicated on a couple of principles that should have a lot of appeal to the stuffed shirts in the corporate world: power and speed. Then again, the speed and power of graphics cards is used mainly for fun purposes, which is somewhat antithetical to the nature of corporate life.

A big showdown has been brewing between two types of graphics card technologies this year: transform and lighting (also known as T & L) and FSAA (Full-Scene Anti-Aliasing). Companies, such as NVIDIA and ATI Technologies, who incorporate this technique in their graphics chips hype transform and lighting as the next big thing in graphics cards. Transform and lighting does some very fancy geometrical footwork and uses complex lighting and shading techniques to improve the quality of 3-D graphics. The opposition, 3dfx, touts FSAA as though it were the greatest thing to happen to graphics cards since Doom popularized 3-D gaming. FSAA is a method that many brands of graphics cards use to smooth out the rough edges of images in 3-D applications. It polishes the stuff you see on-screen, and 3dfx's version of FSAA is exceptional.

Transform and lighting has generated a lot of buzz in the gaming community, but from a practical point of view, it hasn't had much affect on the graphic card market. Kathleen

Quick Tips

To clean a dirty mouse, start by removing the trackball from the bottom of the device. You can clean the trackball by rubbing it with a damp cloth or using soap and water. To clean the rollers inside the mouse, use a Q-Tip and a little soap and water to scrub the dirt and grim off the horizontal and vertical rollers. Reassemble the mouse when finished.

Maher, editor-in-chief of *The Peddie Report* from Jon Peddie Associates, says, "T & L is one of those buzzwords—you gotta have it. But nobody exactly knows why yet, because there are very few applications that take advantage of it, apart from a few games."

Maher says that NVIDIA's first try at transform and lighting really didn't work all that well, but no one noticed because nobody was using anything that would really put it to the test. Maher says that all the hype about transform and lighting has hurt 3dfx, though. "They can't fill out that check box. They can't say they have T & L."

3dfx does have a couple of things in its favor, however. First, it has a loyal customer base. Second, FSAA lives up to its billing; it really does improve the image of 3-D graphics, regardless of what 3-D application you are using.

But Maher sees a problem in all the 3-D abilities hyped by NVIDIA, 3dfx, ATI Technologies, and other graphics vendors. "The thing I've been thinking about lately," says Maher, "is that there's a disproportionate interest in 3-D. All these products are being sold on the basis of their 3-D capabilities, yet three-fourths of the computer-using populous isn't really using 3-D that much."

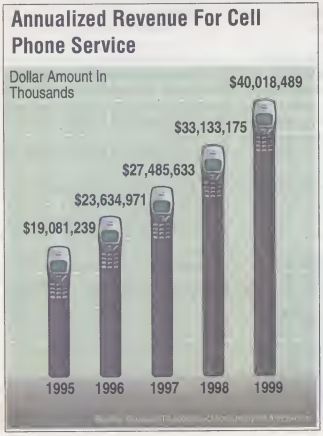
So what gives? Why is 3-D so important? Gamers. Gamers are the engine that makes the graphics card market hum, and there's no such thing as too much power as far as gamers are concerned. The components used to make graphics cards happen to be pretty cheap right now, so graphics card manufacturers can afford to cater to gamers' cravings for the ultimate in graphics card power while still charging relatively low prices.

Workstation users who make their livelihoods designing high-end graphics also benefit from the more powerful cards and lower price points. Maher says, "The ability to manipulate ever-larger models and then shade it and texture it and visualize these products can't be overstated. It's a wonderful thing, and this stuff is practically free for what [graphics card vendors] are selling it for."

They Said It...

"We are going from the worst mouse in the world to the best."

-Steve Jobs, Apple CEO, on the unveiling of a new mouse using optical tracking technology, vs. the hockey puck-like mouse the company previously used, Upside.com, July 19, 2000.



■ **Cellular (WAP-Enabled) Phones.** Cell phones are practically free too, with any number of cellular service providers willing to give you a cell phone when you sign a contract for service. Consumers apparently are very keen on this kind of offer because about 425 million cellular phones were shipped in 2000.

That may seem like a huge number, but according to Larry Swasey, vice president of communications research for Allied Business Intelligence, it's actually lower than some people expected. He says the lower number really shouldn't be too surprising because there had to be a slowdown in the cellular market sooner or later. Still, the cellular industry has been phenomenal over the past few years. In 1995, the annualized revenues from cellular phone service were about $19 billion. By the end of 1999, that number had more than doubled to $40 billion. Not surprisingly, the number of cellular sites in commercial use has also grown dramatically, from 22,600 sites in 1995 to 81,700 sites in 1999.

The cellular industry is expected to continue to be successful in the coming months, despite the minor slowdown in 2000, and the Internet is the main reason. Swasey says 33% of the 425 million phones shipped last year were WAP-enabled (Wireless Application Protocol), meaning they can be used to access e-mail and some online content, such as sports scores and weather information from the Web.

Using a cell phone to retrieve content from the Internet is not like surfing the Web on a home computer though, due to the low bandwidth of current WAP cell phones and the limitations of the displays. However, the next generation of cellular phones, 3G, will begin to appear in 2001. Swasey says the new phones will be able to reach data transfer rates of 144Kbps (kilobits per second), and the quality of displays will continue to improve. Cellular phones will start incorporating Bluetooth in late 2000 or early 2001, which should also be a popular feature among consumers (for more information on Bluetooth and cellular phones, see "The Future's So Bright . . . " in this issue). The introduction of these new technologies leads Swasey to believe that the next few years will be very good ones for the cellular industry.

■ **Modems.** The modem world really hasn't been nearly as exciting as the cell phone industry the past couple of years. The vast majority of people plug along on their 56Kbps modems, just as they did last year and, likely, the year before that. Users have had the option to kick up their modem connections by signing up for DSL (Digital Subscriber Line) or cable modem service in the past, but these services were *much* more expensive than basic 56Kbps service, if they were available at all.

ISPs and cable companies have been working hard to make these services available to a larger audience, however. DSL and cable services are widely available now, and prices have been dropping. The appetite for faster Internet connections is growing along with users' interest in online multimedia and online gaming. Web site designers are also making heftier, more graphics-intensive Web pages, which seem to beg for higher bandwidth.

Cable and DSL modems sales are gaining momentum. Both are attractive technologies, both deliver much faster connections than 56Kbps, and both are becoming more affordable for the average home and small-business user.

Cable seems to be a better fit for consumers, but its reputation has been sullied by a couple of potential problems: security and bandwidth fluctuation. Josh Wise, analyst for Allied Business Intelligence says that these are the two issues that people emphasize as cable downfalls. He says that they can be a problem with sloppy management, but they don't need to be a problem as long as the carriers providing the service take care of business (for more information, see "The Future's So Bright . . ." in this issue).

■ **Home Network Kits.** Akin to modems are home networks. They both have the same essential purpose: connecting your computer to another computer. Of course, the computer you connect to in a home network may be in the next room, while a computer you connect to through the Internet may be half a world away, but the basic concept is the same. You want to send and retrieve data to and from another system.

The need for home networking kits has increased as more and more people install a second and even a third PC in their homes. Shelly Olhava, an analyst for IDC, says some computer manufacturers have begun to include home networking components in new systems, usually in the form of Ethernet ports or NICs (network interface cards). "PC OEMs [original equipment manufacturers] are beginning to look very seriously at the home networking market," she says. Using this method, you can run a cable from one PC to another. NetGear, Linksys, and D-Link are popular vendors of Ethernet home networking kits.

Many people don't care to have cables strewn about the floors of their homes, so they seek other options. Home users who want to create a cable-free network can skip the Ethernet method and choose among wireless, phone line, or power line methods.

Ethernets are the most common home networking kits among consumers today, but that will likely change very soon. Phone lines are expected to surpass Ethernet in 2001, and they are expected to grow in popularity through 2004. Olhava says that wireless and power lines may become popular, too. In fact, Olhava foresees users with home networks incorporating more than one networking option in the near future, such as wireless and phone line networks in the same home.

■ **Digital Camera Trends.** Traditional film cameras, like Ethernet home networks, are on the verge of being surpassed by a newer technology that's rapidly gaining popularity: digital cameras. Michelle Lampmann, analyst for InfoTrends Research Group, says that digital camera sales will surpass that of traditional film cameras in 2002. Film camera sales have been holding steady at about 18 million units per year. Lampmann notes that these figures do not include the sales of single use cameras (disposable cameras), which sell over 100 million units per year in the United States.

Digital cameras are more affordable than ever. Lampmann says that the average price of a point-and-shoot digital camera (a camera that typically has a minimum resolution of 1 million pixels) is $475, which is 32% less than what it cost in 1999. The prices for the higher-end 2 million pixel cameras have dropped 18% in the last year.

■ **USB 2.0.** One of the great things about digital cameras is that you can export the pictures directly to your PC. That task should become even simpler when USB 2.0 comes out. USB 2.0 devices are expected to be widely available in 2001. USB 2.0 will be much faster than the current version of USB. Expect to see speeds in the range of 480Mbps (megabits per second) vs. only 12Mbps for the current version of USB.

Many computer peripherals, including mice, scanners, keyboards, printers, and monitors, already come in USB versions. USB 2.0 is backward compatible, so users will still be able to use their old USB stuff with the new USB 2.0 specification. We expect a slew of USB 2.0 products, from joysticks to speedy scanners to optical mice, will be coming shortly.

The computing world is a busy environment. Concepts, such as smaller, faster, and easier dominate the computer hardware industry, which is fine with us. Many of these trends lead to better products and (thanks to stiff competition) lower prices. And these kinds of trends should continue as PC and peripheral manufacturers return, again and again, to the drawing board. RS

by Michael Sweet

Just the Facts!

Blank CDs for CD-RW or CD-R drives hold 650MB (megabytes) of data, or 74 minutes of audio. If you save audio files in MP3 format, which compresses a minute of music into a 1MB file, you can record more than 600 minutes of audio on a CD.

Do You Know...

how much the first commercially successful portable computer weighed?

In 1981 Adam Osborne introduced the Osborne I, a self-contained unit with 64Kb (kilobits) of memory that included a 5-inch monochrome screen, a keyboard, and two 5.25-inch diskette drives. The $1,795 Osborne I weighed about 25 pounds, not counting the external battery pack necessary to use it away from electrical outlets.

Currents Shaping The Hardware Market

Technology, know thyself. Many technologies and products influence how computer users can use their PCs, just as the appetites of computer users dictate which kinds of products will flourish and which will fall by the wayside. Here are some stats and facts that illustrate what's influencing the computing world today.

Correlations Between Wireless Subscribers & PC Owners

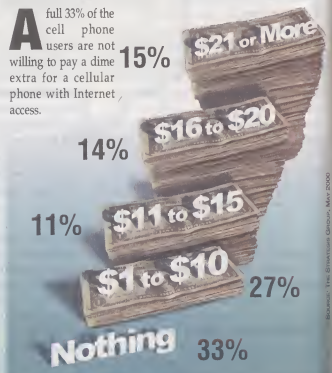
Wireless subscribers who own a PC or a portable:
76.7%

PC or portable owners who plan to buy a cellular phone in the next 12 months:
67.3%

THE INSIGHT RESEARCH CORP.

What Users Would Pay For Cell Phones With Internet Access

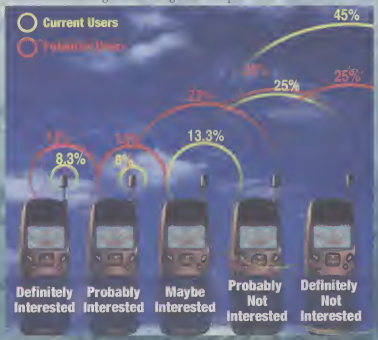
A full 33% of the cell phone users are not willing to pay a dime extra for a cellular phone with Internet access.



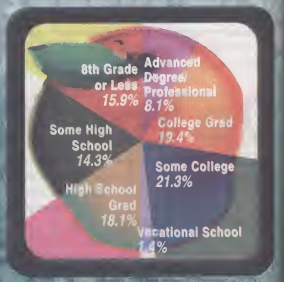
Source: The Strategis Group, May 2000

Limited User Interest In Cellular Phones With E-mail Abilities

Despite the hype surrounding the coming of the wireless age, 45% of the current cell phone owners are definitely not interested in sending and receiving e-mail through their cell phones.

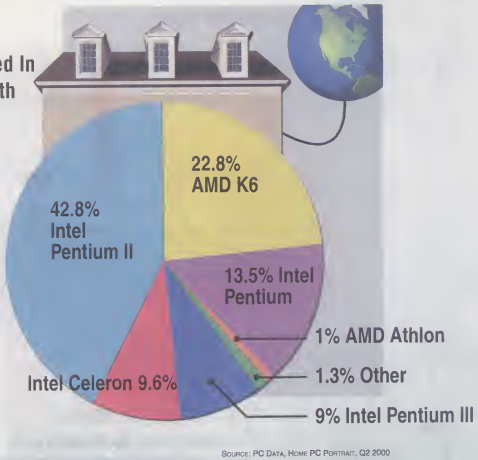


Education Of Home PC Users Who Have Internet Access



Types Of CPUs Used In Household PCs With Internet Access

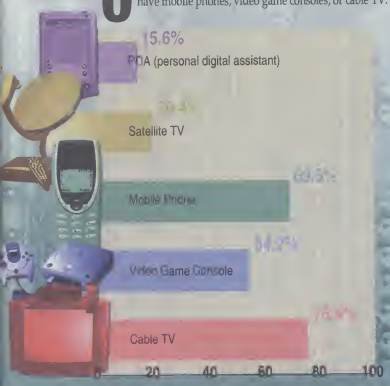
Nearly three-fourths of all PCs in U.S. households with Internet access use a Pentium processor, with Intel's Pentium II processors leading the way.

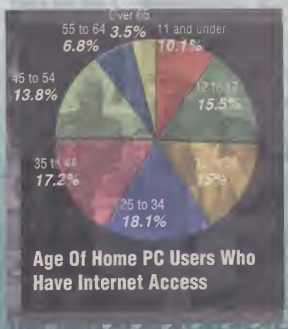


SOURCE: PC DATA, HOME PC PORTRAIT, Q2 2000

Additional Technologies In Homes With Internet Access

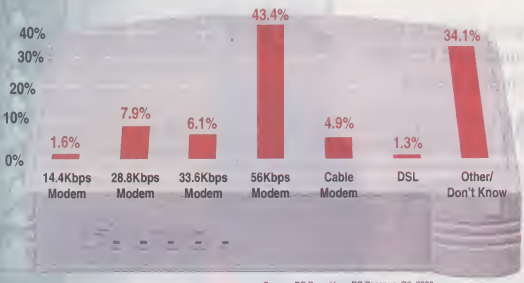
Over half of the homes that have Internet access also have mobile phones, video game consoles, or cable TV.





Internet Connection Type In Households With Internet Access

A 56Kbps modem is the on-ramp of choice for 43.4% of internet users and a scant 1.3% have jumped on the DSL bandwagon.



SOURCE: PC DATA, HOME PC PORTRAIT, Q2, 2000

Number Of Computers Per Household In The United States

Nearly three-quarters of all homes that have a PC have only one, but 29% of homes that have a PC have two or more.

SOURCE: 2000 SIIA CONSUMER SURVEY REPORT, MARCH 2000

U.S. Peripheral Market Shipments By Technology

1998		1999	
Single-function copiers	1,767	Single-function copiers	1,584
Digital cameras	1,037	Digital cameras	1,680
Single-function fax	1,069	Single-function fax	860
MFDs	2,645	MFDs	3,716
Printers	19,626	Printers	22,485
Scanners	6,272	Scanners	8,290
Total	32,416	Total	38,615

2000		2001	
Single-function copiers	1,422	Single-function copiers	1,222
Digital cameras	2,566	Digital cameras	3,832
Single-function fax	753	Single-function fax	708
MFDs	4,718	MFDs	5,484
Printers	24,887	Printers	27,301
Scanners	10,376	Scanners	11,997
Total	44,722	Total	50,544

2002		2003	
Single-function copiers	1,042	Single-function copiers	907
Digital cameras	5,554	Digital cameras	7,702
Single-function fax	729	Single-function fax	705
MFDs	6,081	MFDs	8,565
Printers	29,048	Printers	30,142
Scanners	13,598	Scanners	15,476
Total	56,052	Total	61,497

SOURCE: IDC, 2000

Years For Technologies To Reach 50 Million Users

SOURCE: THE INSIGHT RESEARCH CORP.

PC Owners & Their Peripherals

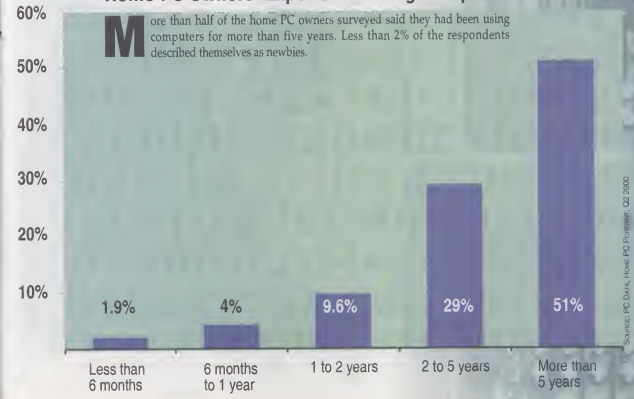
Although mice, printers, modems, and CD-ROM drives are each owned by more than 90% of PC owners, only 12% of PC owners have digital cameras.

	1996	1997	1998	1999	2000
mouse		92%	95%	95%	97%	98%
printer		92%	94%	93%	92%	94%
modem		70%	71%	75%	78%	81%
CD-ROM		82%	87%	90%	93%	96%
DVD-ROM	N/A	N/A	11%	13%	21%	
scanner	N/A	N/A	N/A	N/A	40%	
digital camera	N/A	N/A	N/A	N/A	12%	

SOURCE: 2000 SIIA CONSUMER SURVEY REPORT, AUGUST 2000

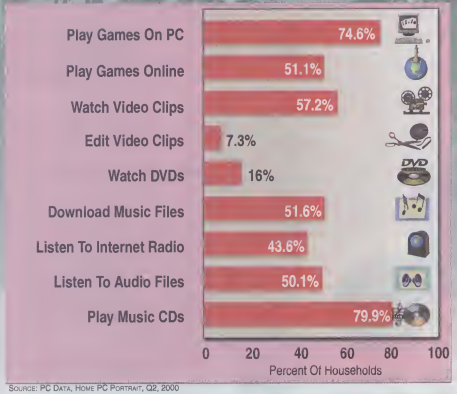
Home PC Owners' Experience Using Computers

More than half of the home PC owners surveyed said they had been using computers for more than five years. Less than 2% of the respondents described themselves as newbies.



SOURCE: PC DATA, HOME PC POINTER, Q2 2000

Computer Activities In Homes With Internet Access



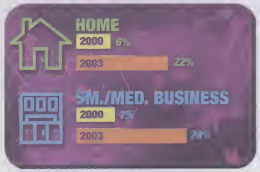
SOURCE: PC DATA, HOME PC PORTRAIT, Q2, 2000

Gender Of Home PC Users Who Have Internet Access

Percentage Of PCs Using Broadband Connections

(T-1, Cable, DSL, or Other)

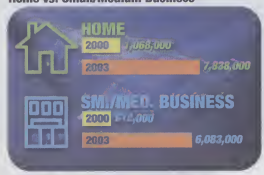
Home vs. Small/Medium Business



SOURCE: THE INSIGHT RESEARCH CORP.

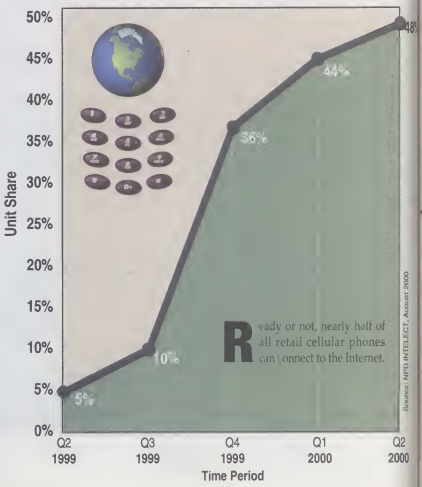
Total Number Of DSL Connections

Home vs. Small/Medium Business

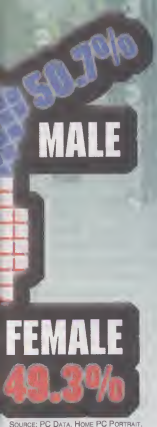


SOURCE: THE INSIGHT RESEARCH CORP.

Internet-Ready Cellular Phones At Retail

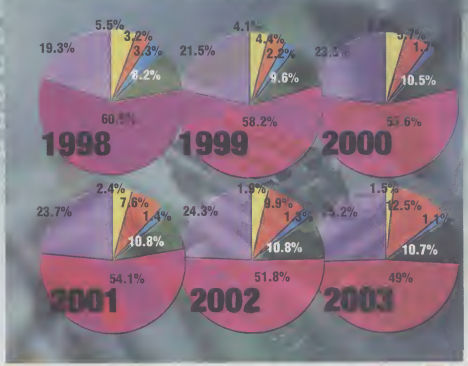


SOURCE: NPD INTELECT, AUGUST 2000

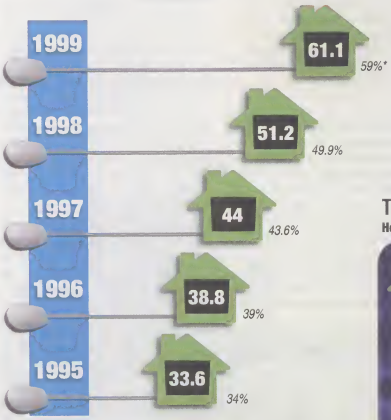


SOURCE: PC DATA, HOME PC PORTRAIT, Q2 2000

U.S. Peripheral Shipment Share By Technology: 1998-2003



SOURCE: IDC, 2000



*Penetration rate: percent of total U.S. households with PCs.

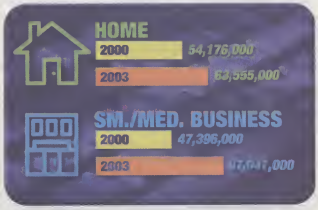
SOURCE: MPAA/U.S. CENSUS BUREAU, MARCH 2000

Number Of U.S. Households With PCs (millions)

Up from 33.6 million households in 1995, 61.1 million U.S. households had PCs in 1999. This is about 59% of all U.S. households.

Total U.S. Computers

Home vs. Small/Medium Business



SOURCE: THE INSIGHT RESEARCH CORP.

The Future's So Bright . . .

Market Trends

Consumers and businesses seem to have a relentless appetite for computer products. Sales of computing products across the board have grown steadily, and in some cases furiously, for the past few years. More than 59% of homes in the United States have a computer, and you'd be hard pressed to find an office or small business that doesn't have one.

The computer industry may hit the occasional speed bump in some areas, such as sales of home desktop PCs, but other market segments, like digital cameras, have done and should continue to do quite well. Let's take a look at several market segments to see how they will fare in the future. We'll also report on new trends that could shape the future of each of these markets.

PCs. There would be no computing industry without the computer, of course, so we'll begin with the PC market. Charles Smulders, a principle analyst for Gartner Dataquest says the PC market got off to a good start in 2000. He says, "Q1 [the first quarter] was relatively strong. But Q2 was less so, because of artificially high growth rates a year ago, and more importantly because of saturation in the large accounts market."

Don't expect the PC market to suddenly shift into reverse, however. PC shipments are expected to increase steadily over the next several years. Prices for PCs could also increase, though. Smulders says that the average prices for PCs have increased slightly overall because the prices of components are higher.

Still, the price/performance ratio is improving, which means people are taking home more powerful systems. Just over half of the PCs in households with Internet access have a processor that's 333MHz (megahertz) or faster, according to a recent report by PC Data. The same report found that almost 75% of PCs in the surveyed households have at least 32MB (megabytes) of RAM (random-access memory), just over 26% of them have more than 64MB of RAM, and 33% also had a hard drive between 5GB (gigabytes) and 10GB.

It's nice to have a PC with a lot of horsepower, but simplicity is important to consumers too. PC simplicity is a Holy Grail that PC makers and software makers alike have been chasing for some time. Many consumers want a PC, but they want it to operate more like a television than a scientific calculator. Thus Windows was made to replace DOS (Disk Operating System); USB (Universal Serial Bus) was developed to relieve the hassle of connecting external devices; and simple, no-frills Internet appliances, such as the iToaster, hit the scene, promising simplicity in a bottle, or a box anyway.

Smulders believes this trend will continue. He says, "Ease of use is becoming increasingly important, and USB clearly is a part of that." USB 2.0 products will be on the market in the next few months, increasing the capabilities of PCs while maintaining the simplicity that USB is known for. USB 2.0 peripherals will be able to transfer data up to 480Mbps (megabits per second), many times faster than the comparatively paltry rate of 12Mbps.

Smulders also says wireless computing is of growing importance. Wireless computing means **Bluetooth**, a wireless technology that enables devices, such as PDAs (personal digital assistants), desktop computers, portables, and cellular phones, to trade information easily. There's a lot of excitement over Bluetooth and rightfully so. The ability to synchronize the address books on your office PC and the PDA on your belt simply by walking into a room is awfully appealing for many users. Bluetooth devices, like USB 2.0, should be appearing in the next few months.

Graphics Cards. Few market segments in the computing industry are as competitive as the graphics card market. The demand for graphics products is strong, but several manufacturers are filling these demands, including Matrox, Creative Labs, 3dfx, ATI Technologies, NVIDIA, and Intel.

S3 is one competitor that has opted out of the graphics card market. S3 had been making graphics chips for several years, and, in 1999, it bought Diamond Multimedia, a popular vendor of graphics cards among other multimedia products. It seemed like a perfect match: S3 would supply the chips, and Diamond Multimedia would supply the graphics boards along with its name recognition in the graphics card industry. But in 2000, S3 decided to ditch its graphics line and focus on digital media products such as MP3 players. S3 sold its graphics operations to VIA Technologies.

Quick Tips

Before you install a new video card, switch to a generic VGA driver. To do this, right-click the Desktop, select Properties, and click the Settings tab. Click the Advanced button, select the Adapter tab, and then click the Change button. In the Update Device Driver window, click the Next button, choose to display a list of drivers, and then click Next again. Click the Show All Hardware radio button, choose Standard Display Types from the list on the left, and select Standard Display Adapter from the list on the right. Click Next and follow any additional on-screen instructions.

Dates To Remember

On Feb. 14, 1946, the creators of ENIAC (Electronic Numerical Integrator Analyzer And Computer) officially unveiled their new computer to the public. The machine had 17,468 electronic vacuum tubes and could perform 5,000 additions per second. At 30 tons and 100 feet long, it was the largest electronic machine in the world at that time.

S3 may be out of the graphics chip business, but the business as a whole is doing fine. The graphics chip market is up this year, which *The Peddie Report* editor-in-chief, Kathleen Maher, attributes to the increase in IGC (integrated graphics chipsets) consumption. IGCs are low-end 3-D graphics chipsets that OEMs (original equipment manufacturers) can incorporate into their value PCs for very little money, which is a good thing for consumers. However, the quality of the graphics provided by IGCs is considerably lower than that of just about any other type of graphics chip you can put in a computer, which is bad. So OEMs buy better quality graphics chips and graphics cards from other manufacturers to beef up their better systems, which is good, at least for the graphics chip market.

Maher says that there was some concern that IGCs would take over the market and hurt the sales of other types of graphics chips and cards, but that has turned out not to be the case despite the fact that IGCs are the fastest growing segment of the market. She says producers of IGCs have little interest in improving the quality of IGCs because they are specifically designed to provide baseline 3-D graphics only, and consumers generally haven't shown much interest in paying extra for improved IGCs. Consumers would rather choose better quality graphics cards provided by industry heavyweights, such as Creative Labs, 3dfx, and ATI Technologies. OEMs know this, of course, which is why they also buy better quality graphics chips and graphics cards for some of their PCs.

Another trend aimed at improving PC graphics is the inclusion of more and better memory in the graphics cards. Most new graphics cards are loaded with 32MB of memory. Some graphics cards come with 64MB of memory. There are two types of graphics memory in vogue today: SDRAM (synchronous dynamic RAM) and DDR RAM (double-data-rate RAM). DDR RAM is superior to SDRAM because it executes two operations per clock cycle rather than one.

A graphics card with 64MB of DDR RAM may very well make a computer gamer pass out in ecstasy, but it's hardly practical for most consumers. Maher says, "32MB is a whole lot for just about anybody, even serious gamers. I think you'll see 64MB be most practical in the workstation space."

Maher believes that 32MB of memory will be the customary amount of memory on graphics cards, though shoppers will still be able to choose between SDRAM and DDR configurations. Whether graphics cards with 64MB of memory will still be available several months from now is tied to the availability of memory. "We're in a really great period right now as far as [memory] prices go . . . but there's nothing to say that . . . in a year or so there won't be a shortage of memory," says Maher, who predicts that "this luxury of putting 64MB on a board . . . is going to slide away."

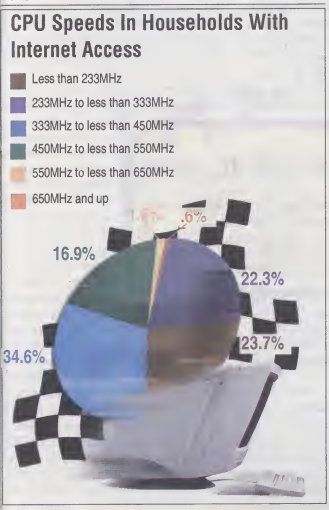
Do You Know...

when the micro-processor was invented?

Intel designed the first microprocessor, the 4004, in 1971. It consisted of 2,300 transistors and ran at a clock speed of 108KHz (kilohertz, or thousands of cycles per second). Nearly 30 years later, the Pentium III processor contains 28 million transistors and runs at speeds up to 1GHz (gigahertz, or billions of cycles per second).

Home Networking Kits. Home networking hasn't been a big market in the PC world, but it's one that's bound to grow quickly as more and more households buy a second PC. Less than 1 million homes with a PC had a home network in 1998, but that number is expected to increase to more than 17 million by 2004, according to IDC. IDC analyst Shelley Olhava says that 2000 was a fairly good year for home networking products in terms of sales and shipments. By the end of 2000, 7.1% of homes with a PC are expected to incorporate a home network of some kind.

Olhava says there are four main home networking products: Ethernet, phone line, wireless, and power line. Ethernet is currently the most popular, accounting for just over half of all home networks. However, Ethernet home networks are expected to drop rapidly in popularity as the phone-line method of connection gains in popularity. According to a report by IDC, phone line home networks, using the de facto HomePNA (Home Phoneline Networking Alliance) standard, could make up more than half of all home networks by the end of 2001, even though phone line networks only accounted for 36% of all home networks in 2000. Olhava says that about 29% of home networks installed in 2000 will be phone line networks. It's popular because it's simple to install and maintain, as it uses standard phone jacks to connect PCs to each other.



Wireless home networking kits are another option, but Olhava says this technology has been hampered by a standards war between supporters of HomeRF (Home Radio Frequency) and 802.11b, the two major wireless home networking standards. This isn't the only thing impeding wireless home networks. Olhava says, "Wireless is still somewhat expensive and until fairly recently, there were not a lot of wireless solutions available." Olhava predicts that only about 4% of all of the home networks installed in 2000 will be wireless.

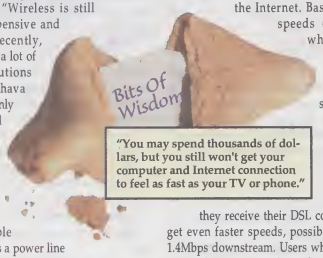
Another option available to consumers is a power line home network. On paper, a power line home network looks like a very elegant solution. All you have to do is plug into a standard electrical outlet, and your PCs are wired to each other. But as with wireless, power line technology is being held back by a lack of standards and products.

You would expect one of these four methods to eventually dominate while the rest are "betamaxed." However, Olhava believes that's not necessarily true. She says, "We actually believe that home networks will exist that [comprise] multiple technologies, like a home network containing both HomePNA and wireless connectivity." Olhava does say that HomePNA phonelines can become the dominant home networking technology, but it's hardly a lock. Both wireless and powerline home networks could give phoneline networks a serious run for their money.

Modems. A similar showdown is occurring in the modems market. The 56Kbps (kilobits per second) modems have been the standard for a few years now and are certainly the most common way home users connect to the Internet. Cable modems and DSL (Digital Subscriber Line) connections are becoming more popular because of the increased data transfer rates and dropping prices of high-speed service.

However, the big question for consumers and small businesses that want high-speed Internet access is which technology to use: cable or DSL? Both of them have advantages and disadvantages.

Josh Wise, analyst for Allied Business Intelligence, says that the bare bones speed for DSL is a rather hearty 384Kbps **downstream**, or the rate at which you can retrieve data *from* the Internet. Basic **upstream** speeds (the rate at which you can send data from your computer) start at 128Kbps. DSL users who are closer to the main office from which they receive their DSL connection can get even faster speeds, possibly as high as 1.4Mbps downstream. Users who are willing to spend extra on an enhanced package can get connected at 6Mbps or 7Mbps.


Bits Of Wisdom
"You may spend thousands of dollars, but you still won't get your computer and Internet connection to feel as fast as your TV or phone."

The data transfer rate for cable modems fluctuates because you're sharing your connection with others on the cable network, which can be annoying for some users. Wise says, "Some people say 'I'd rather have 200Kbps all the time than have 50 now and 500 later.'" Still, cable users can achieve pretty impressive data transfer rates during light times of the day, up to 2Mbps for a downstream connection. Upstream data transfer rates are about 128Kbps on average, Wise says.

Home users are more likely than businesses to choose cable modem connections, because businesses prefer to have a steady, higher-bandwidth connection, especially if they have servers. Wise says that many cable operators don't allow businesses to run servers on the cable lines, nor do they offer business-class services, making DSL the natural alternative.

Cable is fine for most home users, because home users typically don't need a big upstream connection. Wise says that concerns regarding security and connection speeds are largely overblown. He points out that encryption is now required between the cable user and the head end of the network, which helps alleviate the security issues. As far as bandwidth problems are concerned, Wise says the cable company simply needs to configure the proper amount of homes in the node. If bandwidth problems arise because too many cable subscribers are connected to the same node, the cable company and ISP (Internet service provider) can simply split the node in two and divide the subscribers accordingly.

Digital Cameras & Scanners. Consumer interest in high-speed Internet access is growing, albeit at a slow pace, but consumer interest in digital cameras has exploded. Michelle Lampmann, analyst for InfoTrends Research Group, says that the sub-$1,000 digital camera market is up 103% from 1999. About 6.8 million digital cameras priced at less than $1,000 will be sold in 2000, whereas only 3.3 million were sold last year. Lampmann says the total revenue from these sales should hit $1.9 billion.

Consumers are warming up to digital cameras thanks to falling prices and improved quality. Lampmann says, "Low prices and megapixel resolution are definitely attracting many first time buyers." She notes two cameras priced at less than $300 that have been very popular: Kodak's DC 215 and Olympus' D-360. Sony cameras are also popular, particularly, the digital Mavica models, which include diskette storage.

They Said It...

"I'm skeptical of these devices that find each other and then start doing things among themselves."

-Jeffrey Hawkins, Handspring co-founder, on such types of wireless communication and self-discovery protocols as Jini and Bluetooth, eWeek, June 27, 2000.

Scanners are also selling well, according to InfoTrends Research Group analyst Janet Kauffman. She says that shipments of scanners in 2000 are 25% higher than in 1999. The scanner market stumbled a bit in the second quarter of 2000, but Kauffman says orders for scanners were increasing for the third quarter, and that should make up for any second quarter losses. Most consumers are inclined to be price sensitive when shopping for a

GUESS WHO?

While working on a project to help increase the human ability to solve complex problems, this former Stanford Research Institute scientist created two wildly popular computer technologies: the mouse and the graphical user interface.

Answer: Douglas Engelbart

scanner and tend to choose models that cost less than $150. More than 27 million scanners will be sold in 2000, and that number could reach as much as 67 million by 2005, according to Kauffman.

■ **Portables, PDAs & Cellular Phones.** Portable computers should sell nearly as many units as scanners over the next few years, which perhaps comes as no surprise given the fact that we are becoming an increasingly mobile society. Bluetooth PC cards, which should crop up in the next few months, should also add value to the portable PC and to PDAs, as well. According to a report from Cahner's InStat, more than 9 million portable PCs will be shipped in North America alone, and 25 million will be shipped worldwide. That number will increase steadily to just less than 21 million portable PCs shipped in North America by 2005 and slightly more than 69 million shipped worldwide.

Michael McGuire, principal analyst for mobile computing for Gartner Dataquest, says 1999 was a very good year for the portable PCs market. PDAs are also becoming very popular, although McGuire says that not nearly as many PDAs will be shipped in the near future as portable PCs despite the great interest in PDAs. About 7 million PDAs will be shipped in 2000, with that number increasing to 20 million by 2003.

Shipping 7 million handhelds in 2000 may be an impressive number for the PDA market, but it's nothing compared to the number of cell phones that were shipped in 2000. Larry Swasey, senior vice president of communications research for Allied Business Intelligence, says that about 425 million cellular phones were shipped worldwide in 2000. Of the cell phones shipped, 33% were WAP (Wireless Application Protocol) enabled, meaning you could use the phone to connect to the Internet and download e-mail and basic Internet content.

Swasey says that the 425 million mark was actually lower than some analysts estimated, but it's still pretty impressive. He points out that with so many cell phones being sold over the past few years, the market was bound to slow down a little at some point. However, Swasey says that the cellular market should pick up in 2001, when G3 (third generation) cell phones are expected to appear. G3 cell phones will whip the current crop of WAP cell phones because G3 phones will be able to attain a data transfer rate of 144Kbps (in ideal conditions, of course).

Bluetooth-enabled cellular phones are also due in 2001, if not the last quarter of 2000. As with PCs and PDAs, Bluetooth cell phones will let you wirelessly transfer data among other Bluetooth devices. Bluetooth is a hotly anticipated feature in the cell phone market, and Swasey expects it to have a huge impact in the cell phones market. Bluetooth, Swasey says, "complements everything. It's the final element between laptops and cell phones" with which you can create your own LAN (local-area network) or PAN (personal area network).

Just the Facts!

Current hard drives can reach speeds up to 15,000rpm (revolutions per minute). A higher RPM results in a faster transmit rate between your PC and the hard drive, but these speedy drives usually require an extra fan in the PC to keep them cool and increase the life expectancy of the drive.

■ **Inkjet & Laser Printers.** Printers are one of the most practical peripherals found in computer users' homes. The vast majority of home users opt for inkjet printers rather than laser printers. The printers market, like the other markets we've discusses, is expected to do well over the next few years. This is especially true of color inkjet printers that are less than $100. More than 5 million sub-$100 printers were shipped in the United States in 1999 according to IDC, and that number is expected to nearly double by the end of 2001.

Color inkjet printers priced between $100 and $200 should also increase in popularity. Nearly 7.5 million printers in this price range were shipped in 1999, and analysts expect that 10.5 million inkjets will ship in 2001.

Higher priced color inkjet printers are expected to fall out of favor with consumers. Shipments of inkjet printers that cost more than $300 will steadily decline between now and 2003.

■ **Optical Drives.** Optical drives have been a staple of computer systems for many years now. Gartner Dataquest principal analyst Mary Craig says that CD-ROM (compact disc, read-only memory) drives have an install base of 400 million units, far more than any other optical drive. CD-ROM drives will continue to be installed on PCs for the foreseeable future, although the numbers will start to decline. According to Gartner Dataquest, more than 123 million CD-ROM drives will be shipped worldwide in 2000, but that number will steadily decrease to 106 million by the end of 2003.

More and more computer vendors are offering CD-ROM *and* CD-RW (compact disc, rewriteable) drives on their new systems. CD-RW has proved a big hit with many consumers because of their convenience and storage capacity. The worldwide shipments of CD-RW drives are expected to top out at 45.4 million units in 2002, after which shipments will drop off.

It seems that the overall expectations for the computer industry are pretty good. Important new developments and standards, such as Bluetooth, are expected to have a major effect on the computing markets in the next several months, which should keep buyers buying for some time to come. RS

by Michael Sweet

State Of The Hardware Market

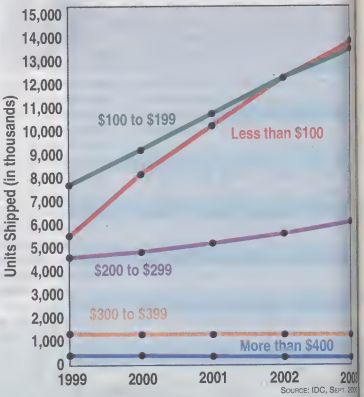
Basic market forces, such as supply and demand, drive the computing industry, like any other industry. In this section, we'll give you forecasts for several computing segments, including PCs, portables, and peripherals. We'll also highlight the market shares of top companies in various categories.

Top 10 Graphics Controller Suppliers By Market Share

1. ATI Technologies
2. NVIDIA
3. S3
4. Matrox
5. SiS
6. 3dfx
7. Trident Microsystems
8. STMicroelectronics
9. 3Dlabs
10. Intense3D

Source: Jon Peddie Associates

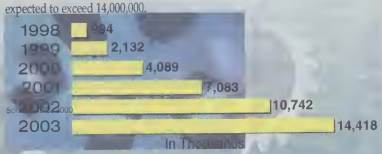
Color Inkjet Printers U.S. Forecast



Source: IDC, Sept. 2000

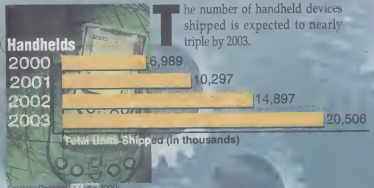
U.S. Home Networking Installations

In 1998, only 994,000 homes in the United States had home networks; by 2003, that number is expected to exceed 14,000,000.



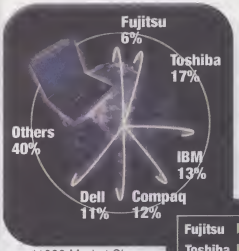
Worldwide Forecast For Handhelds

The number of handheld devices shipped is expected to nearly triple by 2003.

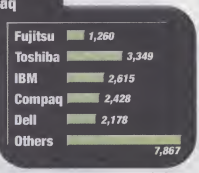


Source: Dataquest (Jan. 2000)

Subscribers To Cellular Phone Services



Top 5 Portable Vendors By Market Share In 1999



*1999 Market Shares
SOURCE: DATAQUEST, AUGUST 2000

Worldwide Shipments Of Portable PCs

1999 Units Shipped (in thousands)

PDAs

(personal digital assistant)

Vendor	Market Share
Palm	65.4%
Handspring	21.6%
Casio	4.4%
Hewlett-Packard	3.3%
NEC	2%

Palm has a firm grip on the PDA market, accounting for nearly two-thirds of all sales.

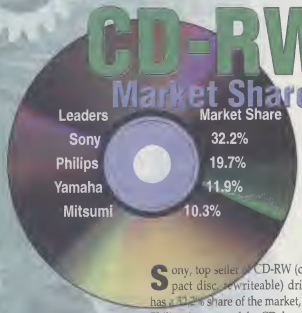
SOURCE: NPD INTELECT, JUNE 2000

Percentage Of Homes With PCs With An Active Network

Analysts forecast that although Ethernet accounts for the majority of home-network connections today, phone line home networks should surpass them by 2001.

SOURCE: IDC, 2000

CD-RW Market Share



SOURCE: DATAQUEST

Sony, top seller of CD-RW (compact disc rewriteable) drives, has a 32.2% share of the market, and Philips, inventor of the CD, has only a 19.7% share.

Types Of Printers In Households With Internet Access

PC DATA, HOME PC PORTRAIT, Q2 2000

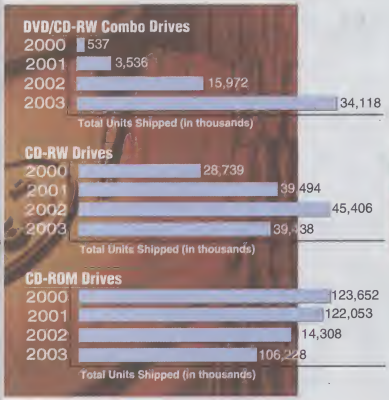
Top Inkjet Printer Manufacturers By Market Share In 1999

Vendor	Market Share	Units Shipped
HP	46.4%	8,927,231
Canon	[illegible]	3,176,101
Epson	14.2%	2,735,985
Lexmark	[illegible]	2,560,356
Compaq	6.2%	1,200,000
Other	3.4%	660,576

SOURCE: IDC, SEPTEMBER 2000

Region
North America
Asia (Not Including Japan)
Japan
Europe
Latin America
Other
Total

Four-Year Forecast For Optical Drives



Source: Dataquest, April 2000

Digital Cameras

Forecast For North America

Point & Shoot Digital Cameras $200-$1,000

Units Sold In 2000	3.1 Million
Units Sold In 2002	5.7 Million
Units Sold In 2004	8.4 Million

Source: InfoTrends Research Group

North America PC Market Share By Vendor

Vendor	1998 Market Share	1998 Units Shipped	1999 Market Share	1999 Units Shipped
DELL	13.2%	4,930,200	17.0%	7,933,462
COMPAQ	16.7%	6,120,550	16.1%	7,513,455
GATEWAY	8.4%	3,137,400	8.9%	4,153,401
HP	7.8%	2,913,300	8.8%	4,106,733
IBM	8.2%	3,062,700	7.3%	3,406,722
OTHERS	45.7%	17,068,950	41.9%	19,533,651
TOTAL	100.0%	37,350,000	100.0%	46,667,424

Source: Cahner's In-Stat, June 2000

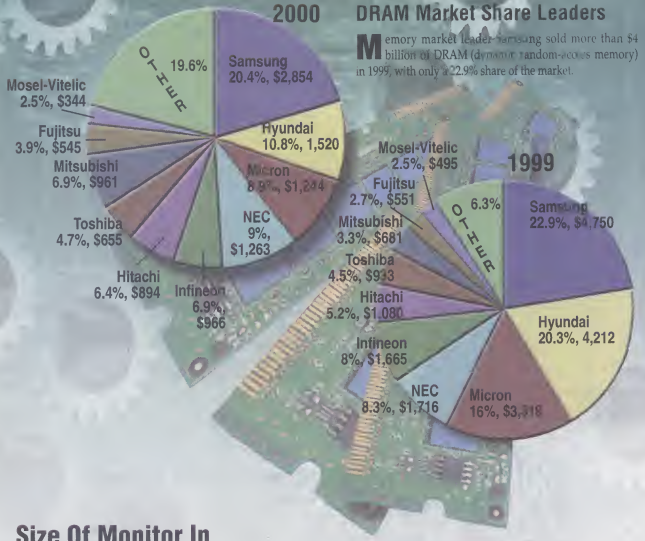
Projected Worldwide Shipments Of PCs 2000 To 2005

2000	2001	2002	2003	2004	2005
42,453,000	46,815,347	56,664,376	57,300,427	62,627,994	68,269,209
11,677,000	13,793,114	15,799,313	18,094,872	17,802,294	15,899,983
8,387,000	10,345,614	12,760,983	15,415,217	17,527,102	21,179,816
22,831,000	24,007,870	24,374,153	27,007,845	30,500,433	34,241,197
3,644,733	4,125,796	4,790,433	5,261,343	5,874,036	6,462,521
15,213,139	17,647,563	18,213,096	19,272,383	25,646,355	32,724,600
104,205,872	*116,735,304*	*128,602,354*	*142,352,087*	*159,978,214*	*178,777,326*

Source: Cahner's In-Stat, June 2000

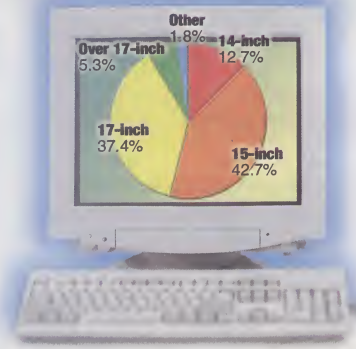
DRAM Market Share Leaders

Memory market leader Samsung sold more than $4 billion of DRAM (dynamic random-access memory) in 1999, with only a 22.9% share of the market.



SOURCE: CAHNER'S IN-STAT

Size Of Monitor In U.S. Households With Internet Access



Region
North America
Asia (Not Including Japan)
Japan
Europe
Latin America
Other
Total

SOURCE: PC DATA, 2000

Worldwide PC Market Share By Vendor

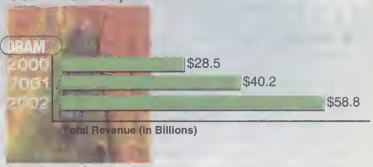
Vendor	Market Share	Units Shipped
COMPAQ	13.6%	13,127,400
DELL	8.2%	7,915,050
IBM	7.3%	7,046,325
HP	6.8%	6,563,700
FUJITSU	5.2%	5,019,300
OTHERS	58.9%	56,853,225
TOTAL	100.0%	96,525,000

Vendor	Market Share	Units Shipped
COMPAQ	13.8%	15,518,324
DELL	10.6%	11,919,872
IBM	8.2%	9,221,033
HP	6.8%	7,646,711
FUJITSU	5.5%	6,184,839
OTHERS	55.1%	61,960,845
TOTAL	100.0%	112,451,625

SOURCE: CAHNER'S IN-STAT, JUNE 2000

DVD Market Share

Projected Revenue From DRAM Sales, 2000-2002



SOURCE: CAHNER'S IN-STAT, 2000

Projected Shipments Of Portables 2000-2005

2000	2001	2002	2003	2004	2005
9,318,921	10,981,378	13,166,094	15,693,748	18,182,321	20,971,587
2,224,115	3,130,952	3,949,828	4,955,920	5,021,160	4,749,346
7,144,506	8,919,961	10,870,467	13,398,273	15,233,836	18,482,760
4,348,830	5,631,476	7,697,101	9,489,243	10,996,755	12,858,111
497,009	616,498	779,838	1,077,624	1,333,370	1,717,885
1,690,349	2,181,159	3,730,393	5,123,039	7,660,599	10,334,084
25,223,730	*31,461,424*	*40,193,721*	*49,737,847*	*58,428,041*	*69,113,773*

SOURCE: CAHNER'S IN-STAT, JUNE 2000

Devices, Peripherals & Components

A Panoply Of Products

It seems the only constant in the computing industry is change. Consumers are inundated with new PCs, as well as the peripherals, components, and gadgets that make PCs even more practical and fun to use. If you want to beef up your computer, there are plenty of interesting products that will suck the green out of your wallet. From interesting new products to standards that will influence how those products work in the future, we'll examine several popular product categories and see what's new in each one.

Desktop PCs. For many years, PC vendors have been competing on a variety of fronts. There has always been a strong push to make PCs ever more powerful, yet at the same time we've seen steadily falling prices for PCs and their various components. Years ago, the big buzzword for PCs was "multimedia." The desire to incorporate sound and graphics into PCs turned the data-crunching word processor into an entertainment center, as well. Computer manufacturers look to make their already-powerful systems even more powerful, PC prices remain low, and PC multimedia is better than ever thanks to powerful new graphics card technology, improved sound cards and computer speakers, and fast DVD (digital versatile disc) drives. Are there no more worlds to conquer? Yes, of course there are.

They Said It...

"We know that the PC era is over. The PC itself is not dead. But it no longer occupies center stage, and it is no longer the only available network access device."

-Lou Gerstner, IBM chairman and CEO, Oct. 11, 1999.

The current trend in PCs seems to be one of style. The beige box is getting a facelift. Apple wasn't the first manufacturer to offer a computer in a color that did not remind you of your ceiling, but the introduction of the iMac in 1999 clearly sent a message that style does indeed matter. The candy-colored iMacs garnered a lot of attention for their unique design, and it seems that other manufacturers are warming up to the idea of making more "personal" personal computers. Charles Smulders, principle analyst for Gartner Dataquest, says, "PC style is clearly becoming more important, although most users are not prepared to pay a significant premium for it."

Compaq is playing the style card, releasing several products that sport a new look. The Presario 7000 and Presario 5000 lines of computers incorporate a splash of color on the front panel of the case, as well as on the speaker grilles of the included multimedia speakers. It offers six colors: smokey quartz, ruby red, sapphire blue, amber orange, amethyst purple, and emerald green.

Compaq is also seeking style points in the "no-hassle PC" computing market with the Presario EZ2000 system. This computer features a compact dark blue design that is shaped somewhat like a 1950's-style toaster and starts at just less than $700.

Compaq isn't limiting its style crusade to the home, however. It has also released a uniquely styled business computer called the iPAQ, which Smulders says is one of the most significant products launched in the PC market, along with Hewlett Packard's e-Vectra (more on the e-Vectra in a moment).

The iPAQ is a slim, upright, network-ready business computer that starts at just $499 (without monitor). Compaq has a legacy-free version of the iPAQ that shuns parallel ports and serial ports in favor of USB-only connections. The idea is to put a powerful yet compact system on an employee's desktop, while eschewing traditional features of desktop computers, such as the aforementioned ports and half-height bays for additional optical drives. Because of this, the iPAQ has a small footprint that Compaq dresses up with a funky design wrapped in a black and silvery-gray two-tone paint job.

Compaq makes another iPAQ for home Internet users, the not-so-creatively named iPAQ Home Internet Appliance. It's a very small, all-in-one system with a flat screen and wireless keyboard that retails for $599.

Hewlett-Packard's e-Vectra is similar to the iPAQ in form and function. It's a very small, slim machine tailor-made for office networks. But the design is subtler than that of the iPAQ. The front of the e-Vectra is dark blue and sports little more than a vertical CD-ROM drive bay door, if that. The small size and small price of the e-Vectra is attractive to corporate buyers who need to put new systems on employee desktops but don't want to hassle with the usual bulky and expensive business PCs.

Of course, these companies are playing catch-up to Apple, and Apple's been busy

Do You Know...

which region of the world has the highest ratio of PCs to households?

According to Roper Starch research released in August, three out of every 10 households in the world now have PCs in them, and 51% of North Americans have PCs in their homes. But North America comes in second, as 55% of Asian households own PCs, compared to 39% in Western Europe and 27% in Latin America.

GUESS WHO?

This electrical engineer from Rochester, N.Y., helped developed the first system-on-a-chip (complete with a 4-bit CPU) in the early 1970s and is considered the father of the microprocessor.

Answer: Ted Hoff

designing new computers with even more colorful designs. The 2000 iMacs incorporate new electrifying colors. Gone are the Jolly Rancher flavored cases, replaced by very bright ruby red, sage, indigo, graphite, and snow. The case looks much like the original iMacs of last year, but the hardware inside has been souped up. The price of an iMac is also user-friendly, starting at $799 for the basic model up to $1,499 for the top-of-the-line iMac DV Special Edition.

Apple also offers the Power Mac G4, another innovative product released last year. This year, Apple put a new twist on the G4 in the form of the Power Mac G4 Cube. The G4 Cube is considerably smaller than the original G4. Gone are the many handles that seem to invite you to throw the thing off a very tall building, a la David Letterman. The G4 Cube looks somewhat like those small aluminum trash cans with the foot pedal that opens the lid. It is not, technically, a cube, but it is small at only 9.8 inches high x 7.7 inches wide x 7.7 inches deep. The package includes two small Harman Kardon speakers that remind us of translucent squid eyes. The G4 Cube is only available in one color, however. Still, Apple is clearly the innovator when it comes to computer style.

Of course, many people prefer substance to style. We're not saying that Apple computers lack substance, but PCs remain the top-selling desktop computers among consumers and businesses alike. The most important component in a PC is, of course, the processor. The two companies most known for desktop PC processors are Intel and AMD. AMD has made great strides in recent years in terms of putting its processors in people's homes, but it still has quite a long way to go to catch up to Intel. A recent study by PC Data found that over 42% of all households with a computer and Internet access had a computer with an Intel Pentium II processor. AMD was a distant second. Only 23% of wired homes had a PC with a K6 processor. Three of Intel's other processors occupy the next three spots: 13.5% of wired homes have a PC with a Pentium processor, 9.6% have a PC with a Celeron processor, and 9% have a PC with a Pentium III processor. Bringing up the rear is AMD's Athlon processor, found in 1% of PCs in homes with Internet access.

Portables. New styles and designs may be the new thing in the desktop PC market, but that's certainly not the case with portable computers. Portables have a job to do. They don't have time for superfluous trimmings like rainbow colors or shapely curves (Apple's iBook excepted). Portables are somber PCs. Carrying a portable computer means you've taken pop's advice to get a job and a haircut.

Michael McGuire, principle analyst for mobile computing, Gartner Dataquest, says that Portables don't lend themselves to funky innovations because, "while the small and medium business appreciates new technology, nobody appreciates innovation for innovation's sake, at least not the corporate IS [information systems] guys who are buying most of the notebooks." Therefore, you won't find especially different or breakthrough products in the portables market. McGuire says the emphasis is on stability. The consumer markets and business markets are very different, and PC innovations in the consumer space don't necessarily play well in the office.

McGuire points to Dell portables as an example of what mobile professionals seek in portable PCs. "Dell remains in the number one spot in the United States . . . because [it] is able to take leading edge technologies that are proven and package them very effectively." If you want power, storage, or connectivity to go, you can definitely find that in a good portable PC. Almost all portables manufacturers offer products with the latest processors, fat hard drives, and even DVD drives. But leave the pretty bows and ribbons at home, because there's no place for those features on the road.

Graphics Cards. The graphics card market, unlike the portables market, seems to recklessly embrace the latest and greatest innovations, regardless of practicality. It was not so long ago that a graphics card with 16MB (megabytes) of SDRAM (synchronous dynamic random-access memory) seemed quite ostentatious. Now, 32MB of DDR (double-data-rate) RAM is common, and some cards come with 64MB of memory. A river of new products has been released in 2000, with NVIDIA leading the way.

Apple Cube

Last year, NVIDIA took the graphics card turf war to a new level with the release of the GeForce 256 GPU (graphics processing unit). This graphics chip was a genuine breakthrough in graphics card technology. It gave consumers the power of a high-end 3-D workstation at very reasonable prices. NVIDIA released several improved GeForce products throughout 2000, such as the GeForce2 GTS, the GeForce2 MX, and the GeForce2 Ultra. Unlike most graphics chipmakers, NVIDIA sells its chips to several vendors so you'll find

Just the Facts!

The first personal computer, the Altair 8800, included 256 bytes of memory. Many current PCs sport 128MB (megabytes) of memory, or about 134 million bytes.

NVIDIA graphics chips on Creative Labs, Guillemot, Leadtek, and ASUSTeK graphics cards, among others. OEMs (original equipment manufacturers) have also increased their consumption of NVIDIA chips.

Playing Capulet to NVIDIA's Montague is 3dfx; it seems that one can hardly be mentioned without the other. Unlike NVIDIA, 3dfx makes graphics chips *and* the graphics cards that use them. 3dfx has not been as active as NVIDIA in terms of releasing new products, though. 3dfx's chip for the 2000 season is the VSA-100, which is found on 3dfx's line of Voodoo5 graphics cards. There are two Voodoo5 cards: the Voodoo5 5500 and the Voodoo5 6000.

3dfx may not have released as many products in 2000 as NVIDIA, but 3dfx has one distinct advantage: It has an extremely loyal following among gamers, who are the driving force in the retail graphics cards market. NVIDIA certainly has a large fan base of gamers, too, which is why the two companies are often seen as going head to head. Kathleen Maher, editor-in-chief of the Peddie Report for Jon Peddie Associates, says that even though 3dfx has the loyal following, NVIDIA is probably a step ahead of it. She says, "3dfx still owns the retail market so far, but NVIDIA has all those OEM wins, and [it has] a . . . retail market through Creative Labs, Guillemot, and Elsa for retail products."

Maher points out that there is another significant player in this game: ATI Technologies. ATI recently released several graphics cards based on its new Radeon graphics chip, including the Radeon 64MB DDR version and the All-In-Wonder Radeon. ATI has a strong presence in both the OEM and retail graphics markets.

■ **Digital Cameras.** As with graphics cards, a slew of new and innovative digital cameras have been released so far in 2000. Michelle Lampmann, analyst for InfoTrends Research Group, says that this is the year of greater product segmentation. Lampmann says, "The digital camera manufacturers are no longer solely delivering higher and higher resolutions. Vendors are delivering more innovative features and products for various market segments."

Some of the more interesting digital camera products are actually not standalone products at all, but attachments for PDAs(personal digital assistants) . Kodak's PalmPix for Palm PDAs and the eyemodule for Handspring's Visor PDA are two examples of products that let your PDA capture digital images.

Low-end (less than $400) cameras tend to be more popular with consumers than more expensive cameras, but manufacturers are still producing high-end products for serious camera enthusiasts. Lampmann says that some vendors are producing digital SLR (single lens reflex) cameras, priced at more than $1,000.

Polaroid is well known for its instant print film cameras, and it has applied that feature to new instant print digital cameras. Olympus also has an instant print digital camera, the C-211, so you don't have to carry a computer and printer to that picnic in the park if you want to share photos with friends right away.

If you're looking for a compact camera, Canon's PowerShot S100 Digital Elph is your ticket. And if you like a little music during your photo sessions, you'll be interested in the Fuji FinePix 40i, which includes an MP3 player.

Lampmann says one of the key developments in the digital camera market is the development of wireless imaging, in which a user can send images through the Internet directly from a cell phone or PDA. Lampmann says that PhotoAccess has announced the eCamera, a design for a digital camera that features Internet connectivity.

■ **Optical Drives.** The optical drives market seems to be stuck in a holding pattern. The most significant optical drive products that were expected to appear in 2000 (and 1999, for that matter) were DVD+RW (rewriteable) drives. Select companies, such as Hewlett-Packard and Philips, have been working on the DVD+RW standard for some time; however, no DVD+RW drives have made it to market at press time.

Mary Craig, principal analyst for Gartner Dataquest, says that the most significant year 2000 development for optical drives was the announcement of the double-density CD by Philips and Sony. Double density CDs, as you might expect, will double the storage capacity of CD, CD-R (CD-recordable), and CD-RW (CD-rewriteable) media.

Compaq Presarios

The one thing that is changing in the optical drives market is the speed of the drives. DVD drives now reach speeds of up to 16X, says Craig, and CD-RW drives can run up to 12X/10X/32X.

■ **Scanners.** Scanners are also getting a speed boost, thanks to FireWire technology. FireWire scanners first appeared in 2000 and were primarily designed for the professional publishing market. However, Janet Kauffman, an analyst from InfoTrends Research Group, says that several "prosumer" FireWire scanners made their debut in 2000, as well. She notes that UMAX released two FireWire scanners priced at less than $300.

Other significant products released this year, according to Kauffman, include Hewlett-Packard's ScanJet 4300, which includes an LCD (liquid-crystal display) screen, and Acer's

Dates To Remember

In 1991, the average hard drive had 145MB (megabytes) of disk space and cost about $5.23 per MB. By 1997, hard drives cost 10 cents per MB with an average of 2.6 gigabytes of space.

S2W scanner. UMAX also released the UMAX AstraNET e3420 and the AstraNET e3470, two "Internet" scanners that can send scanned images directly to your Web page. You can expect this trend to continue.

The release of USB 2.0 is also sure to give scanners a performance boost, although you'll likely have to wait until early 2001 before USB 2.0 scanners become widely available.

■ **Networking Kits.** Most users connect to the Internet through their PCs, of course. But lately, many home users have taken the extra step of connecting their PCs to each other. More and more homes are getting second, or even third PCs, and home networking kits are a fairly easy and inexpensive way to connect those desktops.

Shelley Olhava, an analyst for IDC, points to several new networking products that debuted in 2000, including Apple's AirPort, Intel's AnyPoint, and Lucent's Orinoco solutions. But these aren't the only home networking solutions to appear on the home networking market. Olhava says, "We've seen the introduction of residential gateway products, including . . . 2Wire's HomePortal product, and most recently, Compaq's iPAQ Connection Point Residential Gateway, which will be available within a few months."

Olhava says that phone line networking standards and wireless standards have been established for a while. The biggest standard in development right now is for power line connections. She says that the HomePlug Powerline Alliance (http://www.homeplug.org/index.html) was formed to set a standard for power line networking technology, and the Alliance announced in June that it had settled on a baseline technology. The Alliance is now setting the final specifications for the standard and garnering support for the standard throughout the home networking industry.

■ **PDAs.** You know you're a serious technology junkie if you have a PDA slung on your belt. There are many hot products in this category, but according to Michael McGuire, analyst for Gartner Dataquest, Compaq's iPAQ Pocket PC PDA is the big attention-getter. This PDA has a color screen, voice recorder, expansion pack, and a cool, slim design. McGuire also points out that the first major Palm OS licensee appeared in 2000: Handspring. Handspring's Visor PDA is targeted primarily toward the consumer market, which McGuire says is an unproven market. The Handspring Visor's claim to fame is its innovative Springboard expansion slot, which is an easy way for users to pop in various peripherals (called Springboard modules) designed for the Visor.

Compaq's iPAQ

The Visor is also noteworthy for its cool design. Visors are the iMacs of the PDA set. They come in several vibrant colors, including graphite, green, ice, blue, and orange. Prices for the Visor start at only $149 (compared to $500 for the iPAQ Pocket PC H3650, if you can find one). This reflects the range of average prices you can expect to pay for a PDA.

One of the common features now found among many PDAs is the ability to connect to the Internet, primarily to send or receive e-mail. However, McGuire points out that connecting to the Internet through your PDA is not the same experience as connecting to the Internet from your desktop computer. McGuire says, "This is going to be a subset of the important Web information you need at any point in time." You can get basic Web data through your PDA, but don't try to research your dissertation with it.

■ **Cellular (WAP-enabled) Phones.** Cellular phones are also becoming more and more Internet-friendly. Many cell phone manufacturers, including Motorola and Nokia, make WAP-enabled (wireless application protocol) phones through which you can connect to the Internet. The idea is certainly cool, but in practice WAP-enabled cell phones are somewhat limited in their abilities. Yes, you can download some content, but just like PDAs, surfing the 'Net through a cell phone is nothing compared to surfing on your home PC.

Several new products were set to appear in 2000 that would greatly improve the functionality of Internet-ready cell phones, but Larry Swasey, vice-president of communications research for Allied Business Intelligence, says it just didn't happen. The cell phone industry had hoped to release new and improved G3 cell phones that could transfer data at up to 144Kbps (kilobits per second), which is considerably faster than today's current crop of WAP cell phones. However, Swasey says, the more powerful cell phones should start to appear sometime in 2001.

The increased data transfer rates will certainly be a welcome improvement, but the most exciting development in cell phone technologies will be Bluetooth, a wireless standard that lets you easily transfer data among various devices, including PDAs, cell phones, and computers. Swasey is very excited about Bluetooth cell phones, which should begin to appear as early as the fourth quarter of 2000. Bluetooth technology is the final element needed to create a seamless LAN (local-area network) or PAN (personal-area network) among your personal devices and is expected to be an extremely popular feature in upcoming cell phones.

Tomorrow's technologies, such as Bluetooth, may make a lot of computer users foam at the mouth in anticipation, but from what we've seen, there were plenty of cool products released in 2000 that are worthy of our attention. You may want to leave your credit cards at home next time you go to a computer store to stave off a major spending spree. RS

by Michael Sweet

Bits Of Wisdom

"He who pays a lot for the fastest hardware will soon be indebted to he who pays a little for the second-fastest."

What's Hot In Hardware

If you're like most computer users, you want to know which products are hits and how much they cost. We'll show you the top five products in 10 categories, according to PC Data's June 2000 retail sales figures. We'll also list the average prices for products in popular categories.

Portable Prices: June-September 1999

Price	CPU	Memory	Hard Drive Size	Monitor	CD-ROM/ DVD
Less than $1,500	333MHz	32MB	3.2GB	13.3 inch	24X CD-ROM
$1,500 to $2,000	366MHz	64MB	4-6.4GB	13.3 inch	24x CD-ROM
$2,000 to $2,500	400MHz	64-96MB	6.4GB	14.1 inch	24x CD-ROM or 4x DVD
$2,500 to $3,000	400MHz	96MB	6.4-10GB	14.1 inch	24x CD-ROM or 4x DVD
More than $3,000	400MHz	128MB	14GB	14.1 inch	6x DVD

SOURCE: GARNER'S IN-STAT, JUNE 2000

SOURCE: PC DATA, JUNE 2000

Top5 Portables

1. Presario 1200-XL118 A6-2/500/MMX 64/6 24X 56Kbps 13HPA Win98 *Compaq*
2. Presario 1200-XL106 A6-2/475 32/5 24X 56Kbps 13-inch HPA Win98 *Compaq*
3. Satellite 2675DVD T7/450/MMX 64/6.0 4XDVD 56Kbps 12.1-inch TFT Win98 *Toshiba*
4. Satellite 1605CDS A6-2/450/MMX 32/4.0 24X 56Kbps 12.1DSTN Win98 *Toshiba*
5. Satellite 1625CDT A6-2/475/MMX 64/4.3 24X 56Kbps 12.1TFT Win98 *Toshiba*

SOURCE: PC DATA, JUNE 2000

Top5 Graphic Cards

1. Voodoo3 2000 PCI 16MB SDRAM *3dfx*
2. Voodoo5 5500 AGP 64MB SDRAM DUAL 32BIT *3dfx*
3. Voodoo3 3000 16MB PCI SDRAM *3dfx*
4. Xpert 98 Rage Pro Turbo PCI 8MB SGRAM *ATI Technologies*
5. Voodoo3 3000 16MB SDRAM 3D AGP 2X w/TV Out *3dfx*

SOURCE: PC DATA, JUNE 2000

Top5 Inkjet/Color Printers

1. DeskJet 932C 9/7ppm 2400x1200dpi USB/Parallel *Hewlett-Packard*
2. DeskJet 612C 3/.85ppm 600x600dpi Parallel *Hewlett-Packard*
3. DeskJet 842C 8/5ppm 600x600dpi Parallel USB PC/Mac *Hewlett-Packard*
4. BJC-2100 5/2ppm 720x360dpi Parallel/USB *Canon*
5. Stylus Color 740 6ppm/5ppm 1440x720dpi USB/Parallel MAC *Epson*

SOURCE: PC DATA, JUNE 2000

Top5 Desktop Computers

1. Pavilion 6635 Cel/533 64/10.2 40X 56Kbps MT Win98 *Hewlett-Packard*
2. eTower 500IS Cel/500 32/4.3 40X 56Kbps MT Win98 *eMachines*
3. Pavilion 6645C Cel/566 64/15.0 CD-RW 56Kbps Win98 *Hewlett-Packard*
4. Presario 7360 A6-2/500 64/10 40X 56Kbps MT Win98 *Compaq*
5. Pavilion 8655C T7/533/MMX 64/30 40X CD-RW 56Kbps MT Win98 *Hewlett-Packard*

SOURCE: PC DATA, JUNE 2000

Portable Prices: January To March 2000

Price	CPU	Memory	Hard Drive Size	Monitor	CD-ROM/ DVD
Less than $1,500	450MHz	64MB	4.3GB	13.3 inches	24X CD-ROM
$1,500 to $2,000	475MHz	64MB	5GB	14.1 inches	24X CD-ROM or 4X DVD
$2,000 to $2,500	500MHz	96MB	6GB	14.1 inches	4X or 6X DVD
$2,500 to $3,000	500MHz	128MB	6 to 12GB	14.1 inches	4X or 6X DVD
More than $3,000	600MHz	128MB (min)	12 to 18GB	14.1 inches	4X or 6X DVD

SOURCE: CAHNERS IN-STAT, JUNE 2000

Average Retail Prices

September 2000 estimates supplied by research analysts from various product categories.

CD-RW Drives

$149

Monochrome Laser Printer

$350*

*11-12ppm (pages per minute)

Desktop Color Laser Printer

$960*

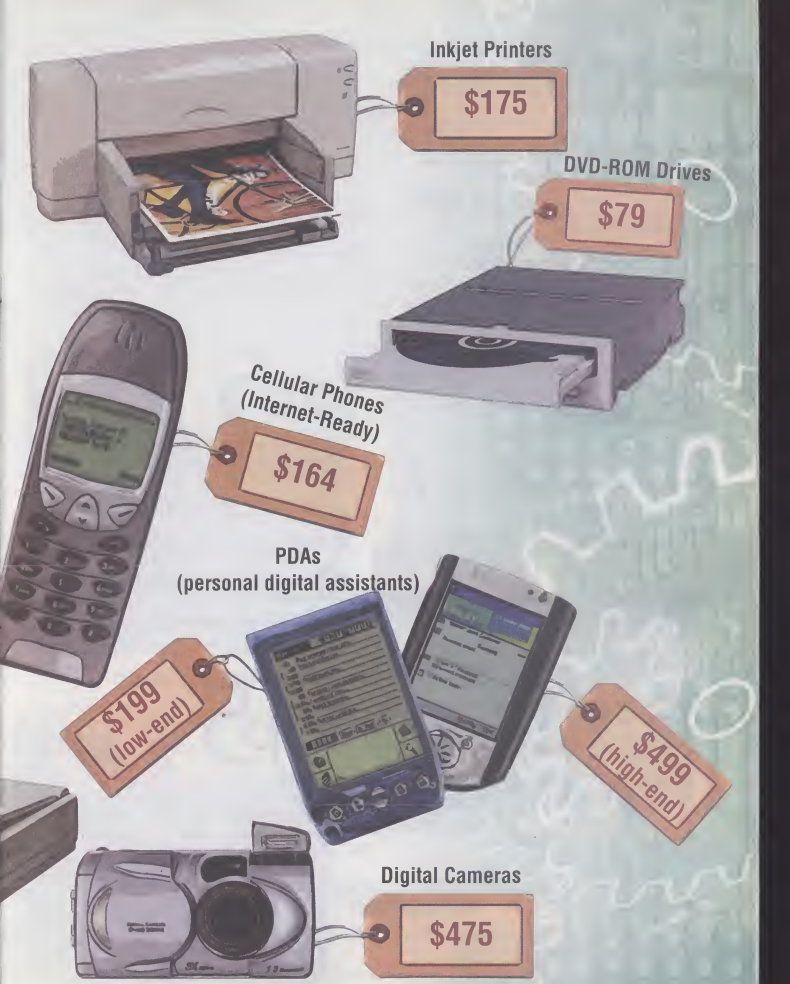
*Less than 6ppm

Scanners

$135

128MB DRAM

$200

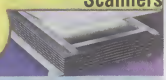

Inkjet Printers
$175
DVD-ROM Drives
$79
Cellular Phones
(Internet-Ready)
$164
PDAs
(personal digital assistants)
$199
(low-end)
$499
(high-end)
Digital Cameras
$475

Desktop PC Prices: June To September 1999

Price	CPU	Memory	Hard Drive Size	Monitor	Graphics Cards	CD-ROM /DVD
Less than $700	350-366MHz	32 to 64MB	4 to 4.3GB	15 inch	4MB	32X CD-ROM
$700 to $1,000	400MHz	64MB	4.3GB	15 to 17 inch	8MB	40X CD-ROM
$1,000 to $1,500	400-500MHz	64 to 96MB	6.4 to 13GB	17 inch	8MB	40X CD-ROM or DVD
$1,500 to $2,000	500MHz	96 to 128MB	13GB	17 inch	16MB	6X DVD
More than $2,000	600MHz	128MB (min)	18 to 27GB	17 inch	16MB	6X DVD w/CD-RW

SOURCE: CAHNER'S IN-STAT, JUNE 2000

Top5 Flatbed/Color Scanners



1. ScanJet 3300Cse 36Bit 600x600dpi USB *Hewlett-Packard*
2. Astra 2100U 36Bit 600x1,200dpi USB *UMAX Technologies*
3. ScanJet 4200Cse 36Bit 600x1,200dpi USB *Hewlett-Packard*
4. ScanJet 3200C 30Bit 600x1,200dpi Parallel *Hewlett-Packard*
5. OneTouch 8100 42Bit 600x1,200dpi USB/Parallel PC *Visioneer*

SOURCE: PC DATA, JUNE 2000

Top5 Networking Kits

1. FENSK05 Fast Enet Network in a Box 10/100 *Linksys*
2. Network Starter Kit EW5PCISK w/Hub & 2 PCI NICs *Linksys*
3. NetGear SB104NA Network Starter Kit wHub & 2 PCI NICs *NetGear*
4. DFE-910 Networking Kit w/5Port DualSpeed Hub/2 10/100 NIC/SW *D-Link*
5. DE-906 Networking Kit w/5Port 10MB Hubby/2 PCI DE528 NIC *D-Link*

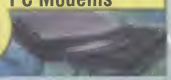
SOURCE: PC DATA, JUNE 2000

Top5 Monitors

1. 17 inch M70 15.7-inch viewable .28mm 1,280 x 1,024 Multimedia Monitor *Hewlett-Packard*
2. 15 inch Pavilion M50 13.8-Inch viewable .28mm 1,024 x 768 60Hz *Hewlett-Packard*
3. 15 Inch MV520 13.8-Inch viewable .28 1,024 x 768 75Hz *Compaq*
4. 17 inch CV700 15.8-inch viewable .28 1,024 x 768 65Hz *Pixie Technologies*
5. 17 inch A70 16-Inch viewable .26mm 1,280 x 1,024 *ViewSonic*

SOURCE: PC DATA, JUNE 2000

Top 5 PC Modems



1. 56Kbps US Robotics V.90 Faxmodem External PC
   3Com
2. 56Kbps Supramax V.90 D/F PCI Modem Internal PC
   Diamond Multimedia Systems
3. 56Kbps US Robotics V.90 PCI D/F Winmodem Internal
   3Com
4. 56Kbps Mach 2 V.90 Winmodem PCI Internal
   Best Data Products
5. 56Kbps PCI Voice Winmodem Internal
   Creative Labs

SOURCE: PC DATA, JUNE 2000

Top 5 Digital Cameras

1. Mavica MVC-FD73 640 x 480 10X Zoom 2.5LCD E-mail Floppy *Sony*
2. DC-215 1Megapixel 2XOpt 8MBCF 1.8LCD SER
   Eastman Kodak
3. D-360L 1.3Megapixels 2XDig 8MBSM 1.8LCD SER
   Olympus Image Systems
4. Mavica MVC-FD85 1Megapixel 3X/2X MPEG 2.5-inch LCD Floppy Diskette *Sony*
5. Mavica MVC-FD88 1.3Megapixel 8X/16X MPEG 2.5LCD Floppy Diskette *Sony*

SOURCE: PC DATA, JUNE 2000

Top 5 Laser/Monochrome Printers

1. LaserJet 1100se 8ppm 600dpi 2MB w/Forms SW
   Hewlett-Packard
2. LaserJet 1100xi 8ppm 600 x 600dpi 2MB
   Hewlett-Packard
3. LaserJet 4050N 17ppm 1,200 x 1,200dpi 16MB
   Hewlett-Packard
4. LaserJet 2100se 10ppm 1,200dpi 4MB
   Hewlett-Packard
5. HL-1240 12ppm 600 x 600dpi 2MB USB/Parallel
   Brother International

SOURCE: PC DATA, JUNE 2000

Desktop PC Prices: January To March 2000

Price	CPU	Memory	Hard Drive Size	Monitor	Graphics Cards	CD-ROM/ DVD
Less than $700	466MHz Celeron	64MB	4 to 10GB	15 inch	4MB	40X CD-ROM
$700 to $1,000	500MHz	64MB	10-15GB	15 to 17 inch	8MB	40X CD-ROM
$1,000 to $1,500	500 to 600MHz	128MB	20GB	17 to 19 inch	16MB	48X CD-ROM or DVD
$1,500 to $2,000	600-650MHz	128MB (min)	30GB	19 inch	32MB	8X DVD
More than $2,000	700MHz to 1GHz	128MB (min)	40GB	19 to 21 inch	32MB	8X DVD

SOURCE: CAHNER'S IN-STAT, JUNE 2000

Hardware Terms

3G—Short for third generation and usually used to describe the most recent wave of mobile communications. While analog technology represents the first generation of mobile communication technology and digital represents the second, third generation technology will provide more bandwidth for mobile devices. Speeds of 384Kbps (kilobits per second) will be possible while on foot and 144Kbps while traveling in a car. This kind of speed allows for a host of multimedia applications within a 3G network.

all-in-one graphics boards—Graphics boards that have MPEG (Moving Picture Experts Group) players and video capturing editing features. Whereas older boards supported 3-D graphics, all-in-one boards can also handle DVD (digital versatile disc) technology, high-resolution capturing, and even TV tuners.

Bluetooth—A technical industry standard that allows wireless connections between portable devices and among portable devices and home and business devices. With a special transceiver chip, PDAs (personal digital assistants), notebook PC, and cell phones can connect with another device, such as a PC, in a short range (the same room) or a longer range (throughout a house). To use this simple technology, manufacturers must first become members of the Bluetooth SIG (Special Interest Group).

Cu-11 ASIC Chip—IBM's latest Blue Logic ASIC (application specific integration circuit) chip designed to save space and boost computer speed and power. The technology was initially intended for servers, routers, and hubs, but there are plans to include the technology in voice-activated Palm PDAs (personal digital assistants) by 2002. The chip supports up to 40 million gates, which are terminals that act as the on/off switch for transistors, and its internal features are hundreds of times thinner than human hair.

digital audio receiver—Once you have packed your PC with MP3 audio files, you can use a digital audio receiver, such as the soon-to-be-released Rio Receiver, to play the files through any speakers in your home or office. These devices use the phone wiring in your house to connect the device to your PC, and the receiver connects directly to speakers anywhere in a building or home. When the PC plays the MP3 files, the data is transmitted through the receiver to the speakers.

digital picture frames—A device, most often portable, that lets users display one or more digital photos in a decorative frame. The high-tech frames typically retrieve the photos from a digital camera's storage cards (such as CompactFlash and SmartMedia), receive them through phone lines, or download them from the Internet. Depending upon the amount of memory, some devices can store up to 500 photos, and some let you create a slideshow. Many frames also integrate a monthly or yearly subscription to a Web site where you can upload and download photos to and from the frame, send them to friends and family, or even get your 35mm film developed and sent to your frame.

Duron Processor—An AMD processor released in June 2000 to compete in low-end PC markets. The processor debuted at speeds of 750MHz (megahertz), 700MHz, and 650MHz and includes a 200MHz front-side bus and 192KB (kilobytes) of on-chip cache, which means the cache memory shares a place on the chip with the processor.

HD-ROSETTA Disc—An innovative metal disc that can archive up to 100,000 images, such as scanned pages from the bible, historical documents from the Library of Congress, or teaching slides of the human body. The disc is licensed by the Los Alamos National Laboratory and marketed by Norsam Technologies. It measures 2.2 inches in diameter, is made of a silicon wafer covered with an outer layer of nickel, and uses microscopic engravings to save grayscale and color images. An HD-ROSETTA ion beam writes data to the disc, and you can read from it using a bright-field microscope or special software that loads the data to a PC.

Holographic-storage—A new storage method being developed by Lucent Technologies, Bell Laboratories, and Imation. The technology writes data to media similar to a single CD using bursts of light. The method is estimated to be 25 times faster than DVD (digital versatile disc) technology, and the disc could hold up to 125GB (gigabytes) of data. Germany's Bayer Institute is developing a holographic storage media, also similar to a CD, that will hold 1TB (terabyte) of data, which is about 200 times more than a CD. IBM is also developing a method of holographic storage, but it burns the data to the media in a slightly different way than Lucent.

iRobot-LE—A home-monitoring, communication robot developed by iRobot. You can control the iRobot unit using a PC running Windows 95/98 or Windows NT, with a broadband Internet connection. It communicates directly with the Internet using a personal Web server and an IP (Internet Protocol) address. The iRobot is equipped with a Pentium processor and the Linux operating system, although you don't need Linux on your home PC to run the robot. The 60-pound unit sports an eight-wheeled base to cover the terrain in your office or home

and a Web cam to broadcast everything you direct it to see over the Internet to your remote location.

middle-school dance—An annoying impasse where two pieces of equipment, such as modems, PCs, networks, and fax machines, that are attempting to communicate with each other are both sitting idle, waiting for the other to begin the transmission. While the name is amusing, and bears some nostalgia for those awkward junior high days, the equipment deadlock is anything but funny, especially when you're waiting for a data transfer.

MXT (Memory eXpansion Technology)—A new chip, actually two chips, developed by IBM for Intel-based servers. The technology uses two chips (a macro and memory controller and an L3 cache chip) to capture, code, and compress data traveling from the processor to the RAM (random-access memory). Using this process, the data is compressed and the memory capacity of the server doubles. IBM hopes to make the chips available for other servers in the near future and eventually adapt them to PCs and laptops.

OmniSky Minstrel V—A wireless modem that fits on the back of the Palm V family of PDAs (personal digital assistants) and connects to the Internet. The unit adds just under 5 ounces to the total weight of the Palm V, stays charged for around 12 hours, and has a built-in antenna for low-signal areas. OmniSky also has an unlimited wireless Internet service that it provides for the modem for an additional monthly fee.

Pentium 4—Intel's new microprocessor, which is scheduled for release in late 2000. Code-named Willamette, the processor will feature a new architecture and higher clock speeds. Pentium III processors are currently offered at speeds up to 1GHz (gigahertz), and the Pentium 4 is expected to surpass these speeds.

set-top box—A device that has been evolving for years. While there are no set standards for set-top boxes, most of the devices on the market decode digital signals for HDTV (high-definition television) broadcasts and let users connect to the Internet. Depending on the manufacturer and price point, some also let users send e-mail, make phone calls, play games, and download music and movies.

six degrees of freedom—A technology incorporated into a pointing device, such as LogiCad's Magellan/SPACE MOUSE, that gives users more control in 3-D environments. Typically, users need devices that incorporate six degrees of freedom to create video animation, navigate 3-D Web sites, design virtual reality and CAD/CAM, and manipulate medical microscopes and robots. With simultaneous control of the six degrees of freedom (X, or side-to-side; Y, or forward and back; Z, or up and down; pitch; roll; and yaw movements), users can more easily maneuver in 3-D environments, with far greater control, because these devices are not limited to sliding around on a mousepad on your desktop.

SoftBook Reader—An electronic reader from SoftBook Press that, at 2.9 pounds, looks like a leather-bound paperback book. It connects to the Internet through a standard phone line and has a built-in 33.6Kbps (kilobits per second) modem, through which you can download books, magazines, and newspapers. You can bookmark your page in *Time* and flip back to Stephen King's, "Riding The Bullet," just as you would pages in a book; there's no scrolling involved either. You manipulate the "pages" by using a Spacebar. You can also annotate or highlight pages and click any of the in-text hyperlinks for more information. The 6-inch wide by 8-inch high LCD (liquid-crystal display) has a backlight and and responds to touch commands. The unit is powered by a rechargeable lithium-ion battery.

Telematics—A technology combining computers and telecommunications. This technology is currently used for computing call-center services or Internet dashboard browsers in vehicles. It is estimated that within the next year, many auto makers will offer telematic devices so drivers can access e-mail, make hands-free phone calls, or listen to Internet broadcasts of news, weather, and sports. For instance, Motorola's telematic services include an onboard GPS (Global Positioning System) and systems that automatically call emergency services if the airbags deploy, synchronize calendars and other applications with PDAs, make remote diagnostics in the event of a breakdown, and tell you where traffic is snarly so you can plan alternate routes.

The New Internet Computer—An appliance with a 266MHz (megahertz) processor that lets you connect to the Internet. It has a CD-ROM drive, a 56Kbps (kilobits per second) modem, 2 USB (Universal Serial Bus) ports, a keyboard, mouse, and speakers, and it starts at $199.99. Add a monitor to the mix for $129.99 more. The New Internet Computer runs Linux 2.2 and comes loaded with Netscape Navigator 4.7. Co-founded by Larry Ellison and Gina Smith, the New Internet Computer Company makes the New Internet Computer.

Transmeta Crusoe processors—Software-based chips developed by a relatively unknown company, Transmeta, with the help of Linus Torvalds, the founder of Linux. The chips, the TM3120 and the TM5400, run at speeds of 333MHz (megahertz) and 400MHz (TM3120) and 500MHz and 700MHz (TM5400). At top speed, the TM5400 runs on one watt of power compared to the 3.3 watts and higher that other chips require, resulting in a longer battery life. The processors are designed for Internet appliances, notebooks, and other mobile computing devices. The Code Morphing software makes upgrading the chip easy and effective because it doesn't entail replacing expensive hardware.

Xbox—A game console created by Microsoft. Xbox is scheduled to hit the shelves in the fall of 2001 to compete with Nintendo, Sega, and Sony in the console market. The unit will feature Pentium III technology with a 733MHz (megahertz) processor, an 8GB (gigabyte) hard drive, a DVD (digital versatile disc) player, broadband Internet access, and four game controller ports.

YOPY—A Linux-based handheld multimedia device. The YOPY plays MP3 music and features voice recording, a built-in speaker, microphone, infrared port, and an MPEG (Moving Picture Experts Group) movie player. It supports an add-on modem to access the Internet or send and receive e-mail. The YOPY has a 4-inch color display and basic PIM (personal information manager) applications, such as address books and calendars. Samsung and G-Mate designed the YOPY, but Samsung is marketing and distributing the product in the United States. RS

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High-Tech Heights

The IT Industry's Top Innovators Bring Home The Awards

Throughout the year, organizations, publications, and businesses present awards for new products, creative Web sites, effective multimedia ad campaigns, and to individuals who have substantially contributed to technological innovations. Many of these awards are handed out at various computer-industry conventions and expositions while others are bestowed at award ceremonies to honor recent achievements in computer-related fields. Below, we've listed some of the more prestigious awards and their winners for the past year.

2000 CNET/PC Expo Best of Show Awards

2000 CNET/PC Expo Best Of Show Awards
June 26-29
New York City

PC Expo (http://www.pcexpo.com) is an annual event that showcases new computer products and technology. The 18th annual show featured more than 600 exhibitors from nearly all aspects of the computer industry. From the mountain of products that appeared at the expo, CNET editors chose six to represent the show's best in various categories.

- **Best Of Show:** Transmeta's Crusoe Processor, which is a CPU (central processing unit) that lets users operate a notebook computer for eight hours or more with a typical notebook battery; in addition, no cooling fan is required.
- **Best Internet Service:** Metricom's Ricochet mobile access, which is a wireless Internet access service that features a 128Kbps (kilobits per second) connection.
- **Best Office Product:** Sony Multiscan N50PS, which is a half-inch thick, 15-inch LCD (liquid-crystal display) monitor that has automatic picture adjustment.
- **Best Software:** IBM HotMedia 3.0 Web site-creation software. HotMedia is a user-friendly program that features several Java applets for Web site embedding.
- **Best Mobile Device:** Transmeta's Crusoe CPU.
- **Best Vision Of The Future:** IBM WebSphere Voice Server, which is a telephone voice-menu system that lets users access documents from a computer and perform other mobile e-business tasks.

SIIA 2000 Immy Awards

SIIA 2000 Market Achievement (Immy) Awards, March 22

SIIA (Software & Information Industry Association; http://www.siia.net) marketing-industry members bestow the annual Immy Awards to companies that have launched recent, successful, innovative marketing campaigns for the software and IT markets. Winning marketing efforts include those that present a unique visual impact and a clear, concise message.

- **Sales Literature:** Bell & Howell Information And Learning—Periodical Archive Mailing
- **Premiums:** West Group—1999 Summer Associate Portfolio Premium
- **User Newsletters:** Bell Atlantic—Bell Atlantic Smart Business Update
- **Catalogs:** Sweet's Group—Sweet's "Tell-All" Back-up
- **Direct Mail Campaign:** Technology Review—TR100 Special Issue Mailing
- **Advertising Campaign:** Northern Light Technology—NorthernLight.com
- **Multimedia Campaign:** Sweet's Group—The "System That Works"
- **Productivity And Programming:** TimeVision—OrgPublisher For Intranets
- **Communications And Internet Applications:** Conversa—Surf The Web With Your Voice
- **Games:** GT Interactive—Harley-Davidson Race Across America
- **Best Product Line Packaging:** Sierra On-line—Hoyle Brand Of Games

SIIA 2000 Codie Awards

SIIA 2000 Codie Awards,
March 13,
San Diego

With 1,200 member companies, the SIIA is a large global trade association for the software code and information industries. The organization's annual Codie Awards recognize new, creative, and ingenious applications and innovative services. Journalists, school technology specialists, and qualified SIIA voting members review, test, and judge the 185 finalists and choose the winners for each award category.

- **Best Software Product Of the Year:** Office 2000 Premium Edition, Microsoft
- **Best Application Development Product:** WebObjects, Apple Computer
- **Best Business Software Debut:** CoPilot 2000, TravRoute
- **Best Communications Product:** pcAnywhere 9.0, Symantec
- **Best Enterprise Software Debut:** Office Timesheet 2000 Suite, Tenrox
- **Best Enterprise Software Product:** IBM DB2 Universal Database
- **Best Graphic & Design Product:** Adobe Photoshop 5.5, Adobe Systems
- **Best Numeric & Database Product:** QuickBooks Pro 99, Intuit
- **Best Personal Finance & Personal Management Software:** Quicken Deluxe 2000 (Windows version), Intuit
- **Best Utilities Product Debut:** GoBack 2.1, Adaptec
- **Best Utilities Product:** Norton SystemWorks 2000, Symantec
- **Best E-commerce Software Debut:** eBot, Digital River
- **Best E-commerce Software Product:** DLJdirect MarketSpeed 3.0, DLJdirect
- **Best E-commerce Storefront Debut:** The Ultimate Cookbook, ucook.com
- **Best E-commerce Storefront Product:** Travelocity.com, Sabre
- **Best Online Brokerage Product:** DLJdirect MarketSpeed 3.0, DLJdirect
- **Best Online Business/Professional Service Product:** Northern Light, Northern Light Technology
- **Best Online Financial News Service Product:** Wall Street Journal Interactive Edition, Dow Jones & Company
- **Best Online Information Service Of The Year:** Northern Light, Northern Light Technology
- **Best Online Legal, Tax & Public Records Product:** Quicken Suite 2000, Intuit
- **Best Online Research Institution Product:** Northern Light, Northern Light Technology
- **Best Game Debut:** Pharaoh, Sierra Studios
- **Best Game Product:** Half-Life, Sierra Studios
- **Best Arcade/Action/Adventure/Role-Playing Game Product:** Half-Life, Sierra Studios; Star Wars Pit Droids, Lucas Learning
- **Best Sports Games Product:** Links LS 2000, Microsoft
- **Best Home Use/Personal Productivity Debut:** TurboTax Home & Business, Intuit
- **Best Home Use/Personal Productivity Product:** TurboTax Deluxe, Intuit
- **Best Home Education Program Debut:** I Spy Spooky Mansion, Scholastic
- **Best Home Education Product:** Encarta Reference Suite 2000, Microsoft
- **Best Education Instructional Management Tool:** Leonardo's Multimedia Toolbox, NEC Systems
- **Best Education Special Needs Program:** Travel The World With Timmy! Deluxe, Edmark
- **Best School-Based Education Product Debut:** Science Court Explorations, Tom Snyder Productions
- **Best School-Based Education Product:** Starry Night Pro, SPACE.com
- **Best Reference Product Debut:** Encarta World English Dictionary, Microsoft
- **Best Reference Product:** Encarta Reference Suite 2000, Microsoft
- **Best Lifestyle Product:** Starry Night Backyard, SPACE.com

e.Millenium Awards

e.Millenium Awards
Comdex/Spring 2000
April 17-20
Chicago

Handed out at the Comdex/Spring 2000 show, the e.Millenium Awards honored the best e-commerce applications, Web sites, and related organizations. An advisory board comprised of 30 CIOs (chief information officers) and other executives from several organizations, including CRPG (Chicago Research & Planning Group)/Silicon-City, Cigna, and Loyola University, judged the finalists and selected the winners.

- **Bricks And Clicks Award:** GATX Rail
- **Technology Excellence Award:** BulkMarkets.com
- **Business To Employee:** Bank One

  Runner up: AutoTrader.com
- **Business To Business, Small Organization:** BulkMarkets.com

  Runner up: High Tower Software
- **Business To Business, Large Organization:** GATX Rail

  Runner up: Fireman's Fund-Parkway Insurance
- **Business To Customer:** uBid.com

  Runner up: WildHippo.com

Best of Comdex

Comdex/Fall 1999 (http://www.comdex.com), November 15-19, Las Vegas

Comdex (http://www.comdex.com) is the show for new and innovative computer technology, where hundreds of manufacturers from around the globe get the chance to show off the best and newest products on a huge stage. Several Comdex shows are typically scheduled throughout the year in various countries, including Egypt, Mexico, and Israel; however, the United States hosts the biggest Comdex gatherings in the spring and fall, where eWEEK (formerly PC Week) lab analysts and corporate sponsors recognize the most innovative, capable, and cost-effective products. Here, we list a few of the big award winners and the runners up for Comdex/Fall 1999. (eWeek cancelled the Best Of Show awards for the Comdex/Spring 2000 show.)

- **Best Of Show/Best Networking Hardware:** Spider-Reader and Spider-Tags (asset tracking system), Wireless Mountain Laboratories

Runners Up:
WaveLAN Turbo 11Mbps (megabits per second) wireless network, Lucent Technologies
Phoneline 10X PCI (Peripheral Component Interconnect) adapter card for home phone line networking, NETGEAR

- **Best Desktop, Mobile & Handheld System:** Qbe Personal Computing Tablet, Aqcess Technologies

Runners Up:
Vectra VL 600 Corporate PC (Pentium III-based desktop), Hewlett-Packard
PCG-XG9 Vaio Notebook (Pentium III-based notebook), Sony

- **Best Personal Productivity Suite:** DataScope 3.0 (data mining, decision support), Mindmaker

Runners Up:
XTNDConnect Server 2.4, Extended Systems
KnowAll (natural language-based search engine), Worldfree

- **Best Enterprise Productivity Suite:** Entice! (Web-based workflow and customer-management application), Multiactive Software

Runners Up:
PDF+Forms for OpenText LiveLink 1.0 (forms design and processing application), Cardiff Software
SmartKnowledge enterprise portal (rapid data publishing and information sharing), NEC Systems

- **Best New Technology:** Split Bridge technology (remote full-speed PCI bus extension), Mobility Electronics

Runners Up:
Personal Information Carrier 16MB (megabytes) storage device, SanDisk
Genetic Caching Workfire Server (adaptive Web-acceleration technology), Workfire Networks

NetWorld+Interop 2000 Best of Show Awards

NetWorld+Interop 2000 Best Of Show Awards May 8-12 Las Vegas

NetWorld+Interop (http://www.key3media.com/interop) is a networking, Internet, and telecommunications trade show that will be held six times in 2000. In addition to the Las Vegas show, the Networld+Interop exposition appeared in Toronto and Tokyo in the summer and will appear in Atlanta, Paris, and Sydney this fall. The Best Of Show Awards for the Las Vegas show include 11 companies in network-related industries.

- **Grand Prize:** Intel—the Intel NetStructure 7210 XML Accelerator

- **People's Choice Award:** AppStream—AppStream For Java Technologies

Best Of Show Awards:

- **Network Applications Software:** AppStream—AppStream For Java Technologies

- **Enterprise Network Infrastructure:** Extreme Networks—Alpine 3808

- **Network Security and Performance:** Indus River Networks—PKI Works

- **Performance Test And Measurement:** Netcom Systems—POS-6505 TeraMetrics SmartModule

- **Carrier Network Infrastructure:** Alcatel—Alcatel OneStream ADSL Subscriber Access Multiplexer

- **Network Management:** Loran Technologies—Kinnetics 3.0

- **Network Servers And Peripherals:** Hewlett-Packard—HP NetServer LT 6000r

- **WAN (wide-area network) And Remote Access:** Cisco Systems—Cisco 827 ADSL Router

- **WAN Services:** MCI WorldCom—Business Class IP Service

- **E-commerce:** Intel—Intel NetStructure 7210 XML Accelerator

- **IP (Internet Protocol) Telephony And Video:** Shoreline Communications—Shoreline IP Voice Communications System 2.0

The 2000 IEEE Awards

The 2000 IEEE Awards
June 24
Vancouver, British Columbia

The IEEE (Institute of Electrical and Electronics Engineers; http://www.ieee.org) is a nonprofit association made up of more than 350,000 computer engineering, biomedical, telecommunications, aerospace, and consumer electronics professionals from 150 countries. Each year, the IEEE presents awards to recipients whose achievements have substantially contributed to the quality of everyday life. Both IEEE members and the general public nominate potential award recipients.

- **Medal Of Honor (IEEE's top award):** Andrew Grove, Intel chairman, for semiconductor technology research.
- **Edison Medal:** Jun-ichi Nishizawa, president of Japan's Iwate Prefectural University and director of the Semiconductor Research Institute, for the invention of the static induction transistor, as well as materials science and technology research.
- **Founders Medal:** Robert W. Galvin, Motorola's Executive Committee chair, for his leadership role in cooperative research between government and private sector organizations and for expanding electronics and telecommunication applications throughout the world.
- **Dennis J. Picard Medal For Radar Technologies & Applications:** Merrill Skolnik, superintendent emeritus, Radar Division, Washington, D.C. Naval Research Laboratory, for his books about radar and his radar technology research.
- **Lamme Medal:** Joachim Holtz, professor and chair, Electrical Machines And Drives, Wuppertal (Germany) University, for inventions for magnetically levitated trains, railway traction drive systems, and power-converter technology.
- **Jack S. Kilby Signal Processing Medal:** James F. Kaiser, visiting professor, Duke University, for digital filter design and implementation, as well as earlier digital processing research.
- **James H. Mulligan, Jr. Education Medal:** David A. Patterson, E.H. and M.E. Pardee Professor, Department Of EECS (Electrical Engineering And Computer Science), University of California at Berkeley, for innovative teaching and curricula.
- **John von Neumann Medal:** John L. Hennessy, provost, Stanford University and David A. Patterson, E.H. and M.E. Pardee Professor of Computer Science, Department of EECS, University of California at Berkeley, for computer architectural innovations and commercialization.
- **Robert N. Noyce Medal:** Morris Chang, chairman and CEO of Taiwan Semiconductor Manufacturing, for leadership in the silicon integrated circuit industry.
- **Haraden Pratt Award:** Charles A. Eldon, director emeritus, Hewlett-Packard, for strategic planning leadership in the IEEE.

The 2000 Webby Awards

The 2000 Webby Awards, May 11, San Francisco

Presented each year by The International Academy Of Digital Arts And Sciences, the Webby Awards (http://www.webbyawards.com) are considered "the Oscars of the Internet" by many Internet professionals and enthusiasts. Entries were judged by 240 journalists, Web developers, and Internet professionals who examined the sites' diversity, perspective, and quality and then selected a winner for each of the 27 categories. In addition, online voters selected sites for the People's Voice Award for each Webby category. Here, we've listed the winners for the fourth-annual Webby and People's Voice awards in the technology- and market-related categories.

- **Broadband: Webby**—VideoFarm (http://www.videofarm.com)

  People's Voice—AtomFilms (http://www.atomfilms.com)

- **Commerce: Webby**—BabyCenter (http://www.babycenter.com)

  People's Voice—Amazon.com (http://www.amazon.com)

- **Finance: Webby**—Gomez.com (http://www.gomez.com)

  People's Voice—PayPal (http://www.paypal.com)

- **Games: Webby**—GameSpy.com (http://www.gamespy.com)

  People's Voice—Shockwave.com (http://www.shockwave.com)

- **News: Webby**—Jim Romenesko's Media News (http://www.poynter.org/medianews)

  People's Voice—ABCNEWS.com (http://www.abcnews.go.com)

- **Politics & Law: Webby**—Politics.com (http://www.politics.com)

  People's Voice—FindLaw (http://www.findlaw.com)

- **Science: Webby**—The Cave Of Lascaux (http://www.culture.fr/culture/arcnat/lascaux/en)

  People's Voice—E-Quarium, Monterey Bay Aquarium (http://www.mbayaq.org)

- **Technical Achievement: Webby**—Google (http://www.google.com)

  People's Voice—Google (http://www.google.com)

Calendar Of Events

101 Computer & Technology Events To Attend

Computer trade shows and conferences happen throughout the year and around the world. These conventions, offering exhibit booths, speakers, and tutorials, let companies recruit new clients or employees and help technical wizards brainstorm and learn about new products and technologies.

Hardware, software, Internet, and telecommunications developers bring their wares to these conventions and show off their new creations. They come to see what their competitors are doing and to market their products and services to prospective clients. They leave the show with new ideas, new customers, and a broader sense of their specialized markets as a whole.

People who aren't in the computing industry attend these conferences, as well. They wander through the exhibits and stop at whatever interests them. If they see something applicable to their workplace, they can establish a business-to-business relationship with the company.

Some conferences seek only information technology professionals while others keep an open door policy so anyone interested can attend. Some are free; others are quite costly.

You can find a conference on something as specific as smart cards or as generic as the entire computer technology industry. The year 2001 looks as packed as ever with informative technology gatherings.

The Shows

A few organizations, such as Key3Media and Thunder Lizard Productions, host numerous shows throughout the year. They repeat some events at different locations to cater to different regions and keep up with the rapid pace of some technologies. Other groups, such as IBand and SCIA (Smart Card Industry Association), focus on maintaining industry standards in their respective fields and convene with industry professionals only once or twice yearly.

@d:tech. This conference is held in New York in November and focuses on Web marketing, advertising, and commerce. Professionals gather here to learn more about their industry through speakers and exhibits. @d:tech also gives many awards to Web advertisers in a variety of advertisement areas. (http://www.ad-tech.com)

Annual Computer Security Applications Conference. This conference gathers 200 to 250 people in New Orleans, La., in December to discuss the technical aspects of computer security. Approximately 70% of attendees are industry professionals, 20% are leaders of technology in the government, and 10% are scholars. The conference begins with a two-day tutorial program, followed by two and a half days of technical programs. Vendors also have booths to show their new products. (http://www.acsac.org)

ASP-DAC (Asia South Pacific Design Automation Conference). The Asian counterpart of DAC (Design Automation Conference), this gathering happens once yearly and focuses on CAD (computer-aided design). 2001's conference will include a special session on asynchronous circuits in CAD tools and design. It is scheduled for late January in Japan. (http://www.aspdac.com)

ASP Summit. The ASP (application service provider) Summit is a two-day conference where ASP developers and providers can exchange ideas and evaluate current industry standard requirements. With its keynote speakers and small seminars, the ASP Summit is building a reputation of sold-out shows. This year it will run concurrently with Fall Comdex in November. (http://www.key3media.com)

CardTech/SecurTech. SCIA hosts this annual smart card conference on smart card technologies for manufacturers and their customers. At this convention, industry leaders show off new technologies and discuss industry standards. In 2001, the conference will occur in Las Vegas in May. (http://www.ctst.com)

CeBIT. One of the most popular information technology conferences, CeBIT happens every March in Germany. At CeBIT 2000, more than 780,000 attendees showed up to see 7,800 exhibits. CeBIT focuses on information technology, telecommunications, office automation, software, and network computing. There are also CeBIT conferences in Asia, Australia, and Istanbul at other times during the year. (http://www4.cebit.de)

CES (Consumer Electronics Show). Hosted by the Consumer Electronics Manufacturers Association (CEMA), CES provides information and exhibitors on such consumer items as mobile and wireless devices, entertainment technologies, and home networking products. Show developers expect more than 1,500 exhibitors and more than 12 new product pavilions at the 2001 show in January in Las Vegas. (http://www.cesweb.org)

Comdex. The largest computer trade show in the United States, Comdex is held numerous times throughout the year and around the world. Comdex hosts its most popular U.S. conference in Las Vegas in November each year. This fall, Bill Gates, chair and chief architect of Microsoft, and Carly Fiorina, president and CEO of Hewlett-Packard, are scheduled to speak. Exhibitors will include 3Com, Cisco Systems, Hewlett-Packard, Kodak, Microsoft, Palm Computing, QUALCOMM, and Toshiba. (http://www.comdex.com)

ComNet. This conference on communications networks professionals is offered once a year. It showcases information and exhibits on network connections and applications for those who create and/or maintain computer networks. Last year, ComNet had more than 450 exhibitors. The show is scheduled for late January in Washington, DC. (http://www.comnetexpo.com)

Computer Fest. Held in Canada, this computer show features new products and concepts, but mostly just great deals on products for sale. It offers seminars, exhibits, computing advice booths, and a computer auction. The year 2000's final Computer Fest will be held in late November in Ontario. (http://www.compfest.com)

CTAM (Cable and Telecommunications Association for Marketing). This organization of IT professionals hosts numerous conferences throughout the year and around the country to promote and develop marketing in cable television, telecommunications, and new media technologies. (http://www.ctam.com)

CT Expo (Computer Telephony Expo). This convention gathers professionals in voice and data convergence, telecommunications, and Internet service. It offers an exposition, conference sessions, and keynote speakers. The show caters to service providers, resellers, and individual users of computer telephony. CT Expo occurs in Los Angeles, California in March. (http://www.ctexpo.com)

DAC. Held yearly, the Design Automation Conference focuses on design tools and methods for electronic design automation. DAC offers events for students in the technology field. More than 16,000 people attended the 37th conference in 2000. The 38th conference will be held in Las Vegas in June. (http://www.dac.com)

DAPPCON (Display Applications Conference). This one-day show occurs numerous times throughout the year. It allows professionals in display technology to compare notes and find technology solutions. This December, it will happen in conjunction with the Flat Information Displays Conference in Monterey, Calif. (http://www.dappcon.org)

DATE (Design, Automation and Test in Europe). An annual event, DATE is for electronic system design engineers. Organizers expect 6,000 participants at DATE 2001, which will focus on telecommunications and automotive design. It is held in March in Munich, Germany. (http://www.date-conference.com)

DCI. This company sponsors numerous conventions throughout the year, each focused on a specific topic in technology. These conferences offer information technology professionals a chance to learn the latest information and news in their fields. There will be DCI Business Intelligence World Conferences in December and February. DCI also will host a Corporate Portals Conference in January, and a DCI Summit on Wireless Computing in March. (http://www.dci.com)

Del Mar Electronics Show. The Del Mar Electronics Show in San Diego will draw more than 400 exhibitors in May. It is one of numerous Virtual Electronics Trade Shows that highlight new products, technologies, and suppliers. (http://www.vts.com)

DEMO. This show is a haven for technical entrepreneurs with new inventions. In 2000, the show featured 81 new products and technologies. About 1,000 investor relations firms, venture capitalists, and technology company business development executives came to peek at what the future may hold. The next DEMO conference will be held in Phoenix in February. (http://www.demo.com)

E3 (Electronic Entertainment Expo). Interactive Digital Software Association hosts this interactive entertainment trade show in the spring, where gaming console makers, software makers for computer and console games, and hardcore gamers convene. At E3 2000, 430 exhibitors showed their wares. It will be held again next spring in Los Angeles. (http://www.e3expo.com)

EShow: The Consumer Internet Event. This Internet show is held yearly in New York in the fall. Targeted at consumers, the event offers a chance for novices and experts alike to learn more about the Web. EShow has scheduled its next conference in September. (http://www.eshowny.com)

Flat Information Displays Conference. Sponsored by Stanford Resources, this show focuses on the display industry. Major display manufacturers will be there to speak, give seminars, and show their products. The show will open in December in Monterey, California. (http://www.stanfordresources.com)

GDC (Game Developers Conference). This annual event focuses on interactive entertainment solutions with speakers, informative sessions, and an exhibition. GDC 2000's speakers included Hasbro Interactive founder Tom Dusenberry. Next year, the show will be held in March in California. (http://www.gdconf.com)

IBand. This show is for network engineers. It focuses on bandwidth management, traffic, and service issues for Internet providers. This year, it occurs alongside ISPCON in November. (http://www.stardust.com/iband5)

ICCAD (International Conference on Computer-Aided Design). This annual conference is usually held in November in San Jose. Since 1982, it has offered a chance for CAD developers to meet and discuss their trade. (http://www.iccad.com)

ICSE (International Conference on Software Engineering). This conference showcases demonstrations, exhibits, speakers, tutorials, and other events on software inventions and information. It is held in Canada in the spring. This year it will be in Ontario, May 12 to 19. (http://www.csr.uvic.ca/icse2001)

IDevelop 2000. Oracle Technology Network hosts this conference, held numerous times throughout the year and around the world. It offers education and training for developers on Oracle's Internet Platform. Hewlett-Packard, Sun, Intel, and other technology companies plan to exhibit at iDevelop 2000 shows. (http://www.technet.oracle.com)

IEEE-VR (Institute of Electrical and Electronics Engineers-Virtual Reality). This show focuses on hardware, software, and peripherals dealing with virtual reality. It offers tutorials, workshops, informational sessions, and exhibits. This year's show will be in March in Japan. (http://www.vr2001.org)

Information Outlook 2000 Conference. The Canberra branch of the Australian Computer Society sponsors this annual fall conference for Australian technology professionals. (http://www.acs.org.au)

Internet World. This show is for World Wide Web businesses and information technology

professionals, and it focuses on e-business. It occurs throughout the year at various locations in the United States and Canada. Spring Internet World 2000 had more than 55,000 attendees and more than 900 exhibitors. Internet World Wireless focuses on such products as cellular phones, PC cards, Web-connected automobiles, and home networks. (http://www.events.internet.com)

ISMR (International Symposium on Mixed Reality). 2001's ISMR in Japan in March will discuss mixed reality environments and the components and technology necessary to create them. The last conference had more than 200 attendees. (http://www.mr-system.co.jp/ismr)

ISPCON. A convention for Internet service providers (ISPs), telecommunications providers, cable operators, and Web hosting companies, this educational conference teaches professionals more about their trade. It occurs several times yearly throughout the world, such as California in November and Toronto in February. (http://www.ispcon.com)

JavaOne. Held for Java programmers and developers, this conference showcases Java technology and new Java products. San Francisco will host a JavaOne conference in June. (http://www.java.sun.com/javaone)

LINUX Business Expo. As the popularity of the open source operating system and software spreads, so does the number of Linux conventions the Linux fans hold and attend. The LINUX Business Expo focuses on implementing Linux into the business world. Many of the exhibitors at the LINUX Business Expo also go to LINUXWorld. The show often runs concurrently with spring and fall Comdex conventions. (http://www.key3media.com)

LINUXWorld Conference & Expo. Another Linux gathering, LINUXWorld, lets Linux users and developers gather to show off their creations. It isn't specifically geared toward Linux in businesses as the LINUX Business Expo is. LINUXWorld, on the other hand, allows businesses and individuals alike to join the Linux fan club. The Fall 2000LINUXWorld hosted software developers such as Caldera, Red Hat, and Sun Microsystems. New York will see a show in late January, and San Francisco will host one in August. (http://www.linuxworldexpo.com)

MACWORLD. Macintosh users and developers can see Apple's latest developments and software developers' latest programs. MACWORLD happens numerous times throughout the year at various locations. (http://www.macworldexpo.com)

NAB (National Association of Broadcasters). Broadcasters meet often at NAB conventions throughout the year to discuss the future of their trade. With the onset of HDTV, their conferences have become linked to the digital age. The main NAB conference occurs in Las Vegas in the spring; the 2001 conference begins April 21. (http://www.nab.org/conventions)

Nepcon. This British show offers seminars, competitions, and exhibits for electronics manufacturers. Nepcon UK occurs in Britain in April. Nepcon East, Nepcon West, and Nepcon Texas occur in the United States at various times during the year. (http://www.nepcon.com)

NetWorld+Interop. Telecommunications, networking, and Internet professionals gather at this convention to discuss business-to-business technology. The conference lasts three days and the exhibition lasts two. Paris holds a NetWorld+Interop in November, and Australia and Atlanta each hold one next September. (http://www.interop.com)

New World Networks. This show for Internet professionals educates attendees on current technologies and displays new telecommunications technologies and their applications. San Jose, Calif.'s December conference will focus on Web portability issues. (http://www.key3media.com)

Online Brokerage Forum. Held in November in Florida, this show offers seminars, think tanks, meetings, workshops, and receptions for financial technology executives on electronic brokerage topics. (http://www.onlinebrokerageforum.com)

PC Career Expo. Running concurrently with PC Expo, this segment of the show offers job seekers a chance to mingle with employers in the information technology business. PC Career Expo 2000's recruiters included Cisco Systems, General Motors, and Sony Electronics. (http://www.pccareerexpo.com)

PC Expo. Much like Comdex, this computer trade show draws the major business-to-consumer manufacturers. It focuses mainly on hardware and is held annually in New York in the spring. In 2000, PC Expo had more than 600 exhibitors such as Dell Computers, IBM, and Toshiba. Speakers included Jeffrey Bezos of Amazon.com fame. (http://www.pcexpo.com)

PC Forum. This annual event brings together approximately 650 technology industry leaders to compare ideas and learn from speakers and presentations. It is sponsored by Edventure Holdings and occurs each spring. Next year it will be in Scottsdale, Ariz. (http://www.edventure.com)

Photoshop Conference. For Photoshop fanatics or those who want to become one, this is one of Thunder Lizard Productions' numerous conferences throughout the year on computer graphics, desktop publishing, and Web issues. Since 1992, the company has hosted more than 50 conferences for a total of more than 20,000 attendees. The next Photoshop Conference will be in January in San Francisco. (http://www.thunderlizard.com)

QWE2000 (Quality Week Europe 2000). This show is for software professionals, focusing on the program creations and languages. QWE2000 offers a convention and exposition for software and Internet products and technologies. It is held in Belgium in the fall. (http://www.soft.com)

Scandinavian Electronics Fair. This is one of the only Scandinavian electronics shows, hosted by Norway each fall. Last year, the event drew 400 attendees from Nordic countries, and convention leaders hope the show continues to grow. September's event will be called the Industrial Electronics Exhibition. (http://www.scanexpo.com)

Seybold. This computer trade show isn't for computer manufacturers at all; it's for those who write about computer manufacturers. Seybold brings together technical writers, publishers, and Web developers to help them improve their publications. Seybold's conventions bring in as many as 35,000 attendees. They occur in Boston in the spring

and San Francisco in September. (http://www.seyboldseminars.com)

SITE (Society for Information Technology and Teacher Education). An annual spring event, this conference hosted by the Association for the Advancement of Computing in Education helps teachers integrate technology into their classrooms. It will take place in Orlando in March. (http://www.aace.org)

Software Technology Conference. Sponsored by the U.S. Air Force, Army, Navy, and the Defense Information Systems Agency, this annual conference offers information and training on software engineering. Many attendees are from government agencies, but many more are civilians. This year's theme will be "2001 Software Odyssey: Controlling Cost, Schedule, and Quality." It will be held in Salt Lake City in the spring. (http://www.stc-online.org)

Techfest. Sponsored by IIT Bombay, this three-day festival occurs annually in India. Techfest aims to promote technology and make people excited about it. Attendees enjoy lectures, competitions, and workshops geared toward advancing the technology revolution. Next year's festival will be Feb. 2 to 4. (http://www.techfest.org)

Technology in Government Week. Aimed at those interested in the way technology affects the government and how the government can tweak its computer programs and operations, this conference is held in Canada in October. It includes exhibitions, informational sessions, workshops, and awards for excellence in a variety of categories. (http://www.key3media.com)

TED Conference. TED 11 will be the 27th annual TED(Technology, Entertainment, Design) conference on technology and communications. Steve Case, chairman of America Online, and Sergey Brin, co-founder of search engine Google.com, are among the scheduled speakers for the February event. (http://www.ted.com)

Web Advertising 2001. Thunder Lizard Productions hosts this conference once yearly. This show features sessions, speakers, and luncheons dealing with Web Advertising. It is primarily for advertisers and Web site publishers who deal with Web marketing. New York will host the next Web Advertising convention in April. (http://www.thunderlizard.com)

Web Design Conference. Thunder Lizard's three-day conference gives beginning designers a great opportunity to jump into the field. From how-to informative sessions to inspirational keynote speakers, Thunder Lizard Production's Web Design Conference offers Web designers a convention of their own. The Web Design Conference is held at various times and locations; one will open in February in Atlanta, Ga. (http://www.thunderlizard.com)

Web Design World. This conference is longer and more in-depth than the Web Design Conference, covering all aspects of Web design from coding a Web page to maintaining its server. Thunder Lizard Productions offers it in late summer in Seattle, Wash. (http://www.thunderlizard.com)

Web Marketing World. This conference offers several days (Oct. 30 to November 3, 2000) of keynote speakers and informative sessions on Web marketing strategies, including e-mail marketing, Web site advertising, and free promotions. Thunder Lizard Productions will host the next conference in New Orleans. (http://www.thunderlizard.com)

Winter Simulation Conference. This December show gathers leaders and hobbyists of simulation and animation technologies. The Florida conference will include a KidSim Program where children can learn about simulation and a Simmedia Theater where attendees can watch programs on computer animation and simulation technologies and histories. (http://www.wintersim.org)

The Calendars

At press time, many convention organizers did not have exact dates and locations for late 2001 shows. Therefore, fall 2000's schedule looks much busier than fall 2001's, for now. Most shows in fall 2000 will be offered again in fall 2001; check the event's Web site for details as fall 2001 draws near. Here we list 101 events you can check out in the next year.

November 2000

Oct. 31 to Nov. 2: Nepcon Texas at the Dallas Convention Center in Dallas. The exhibition will be open Nov. 1 to 2.

Nov. 3 to 5: Online Brokerage Forum at the Westin Innisbrook Resort in Palm Harbour, Fla.

Nov. 5 to 9: ICCAD 2000 at the Doubletree Hotel in San Jose, Calif. Vendor suites will be open Nov. 6 to 8.

Nov. 6 to 9: NetWorld+Interop 2000 Paris. Located at the Parc des Expositions de Paris, Porte des Versailles, Paris. The conference will be open Nov. 6 to Nov. 8, and the exhibition will run from Nov. 7 to Nov. 9.

Nov. 7 to 8: iDevelop 2000 at the Austin Convention Center in Austin, Texas.

Nov. 8 to 10: @d:tech New York in New York.

Nov. 8 to 10: iBand at the San Jose Convention Center, San Jose, Calif.

Nov. 8 to 10: ISPCON Fall 2000 in San Jose, California.

Nov. 10: Information Outlook 2000 Conference at the Manning Clark Centre of the Australian National University, Canberra, Australia.

Nov. 13 to 17: COMDEX/Fall 2000. Located in Las Vegas, Nev. The Las Vegas Convention Center, Sands Expo and Convention Center, and the Las Vegas Hilton will house the exhibits.

Nov. 13 to 17: Linux Business Expo, concurrent with COMDEX/Fall in Las Vegas.

Nov. 14: Ecommerce Venture Forum, concurrent with COMDEX/Fall in Las Vegas. This conference will discuss Web economics.

Nov. 15 to 16: ASP Summit, concurrent with COMDEX/Fall in Las Vegas.

Nov. 20 to 24: QWE2000 Conference at the Sheraton Brussels Hotel in Brussels, Belgium. The Software Quality Week and Internet Quality Week expositions will be open Nov. 22 and 23.

Nov. 21 to 22: iDevelop 2000 at the World Trade Center in Mexico City.

Nov. 24 to 26: Computer Fest Christmas 2000 in Mississauga, Ontario. The show is located in Arrow Hall at the International Centre.

Nov. 28: CTAM 2000 Pre-Western Luncheon in Los Angeles.

Nov. 29 to 30: iDevelop 2000 at COEX in Seoul, South Korea.

December 2000

Dec. 5 to 7: DCI Business Intelligence World Conference in Miami.

Dec. 6 to 9: COMDEX India/IT World 2000. It will be located in the Pragati Maidan Convention Center in New Delhi, India.

Dec. 10 to 13: Winter Simulation Conference 2000 at the Wyndham Palace Resort and Spa in Orlando, Fla.

Dec. 11 to 12: New World Networks in San Jose, Calif.

Dec. 11 to 15: Annual Computer Security Applications Conference at the Sheraton Hotel in New Orleans, La.

Dec. 12: DAPPCONN at the Monterey Conference Center in Monterey, Calif.

Dec. 12 to 14: Flat Information Displays Conference in Monterey, Calif at the Monterey Conference Center.

January 2001

Jan. 6 to 9: 2001 International CES at the Las Vegas Convention Center, the Las Vegas Hilton, Alexis Park and the Riviera Hotel in Las Vegas.

Jan. 9 to 12: MACWORLD Conference and Expo/San Francisco 2001 in the Moscone Convention Center in San Francisco, California.

Jan. 22 to 24: DCI Corporate Portals Conference in San Francisco, California.

Jan. 22 to 24: Photoshop Conference in San Francisco, California sponsored by Thunder Lizard Productions.

Jan. 28 to 31: CTAM 2001 Research Conference at the Sheraton Bal Harbour in Bal Harbour, Fla.

Jan. 29 to Feb. 1: ComNet in Washington, D.C. at the Washington D.C. Convention Center/The Renaissance Hotel. The expo will run from Tuesday through Thursday.

Jan. 30 to Feb. 2: LINUXWorld at the Jacob K. Javits Convention Center in New York.

Jan. 30 to Feb. 2: ASP-DAC 2001 at the Conference Center, Pacifico Yokohama in Yokohama, Japan.

February 2001

Feb. 2 to 4: Techfest in India.

Feb. 4 to 6: DEMO 2001 at the Point Hilton Tapatio Cliffs in Phoenix.

Feb. 5 to 8: Internet World/ISPCON Canada at the Metro Toronto Convention Centre in Toronto; Canada. Exhibitors will show their booths Feb. 7 and Feb. 8.

Feb. 12 to 14: Web Design Conference in Atlanta, Ga., sponsored by Thunder Lizard Productions.

Feb. 13 to 15: DCI Business Intelligence World Conference and Exposition in Chicago.

Feb. 15 to 18: COMDEX Greece 2001 in Athens.

Feb. 21 to 23: Internet World Wireless at the Jacob K. Javits Convention Center in New York.

Feb. 21 to 24: TED 11 at the Monterey Convention Center in Monterey, Calif.

Feb. 25 to March 1: Nepcon West in Anaheim, California at the Anaheim Convention Center. The exhibition will be from Feb. 27 to March 1.

March 2001

March 5 to 10: SITE in Orlando, Fla. at the Holiday Inn International Drive Resort.

March 6 to 8: CT Expo 2001 at the Los Angeles Convention Center in Los Angeles.

March 6 to 9: COMDEX France 2001 in Parc des Expositions de Paris, Porte des Versailles, Paris.

March 12 to 14: Web Marketing 2000 convention in Monterey, Calif.

March 12 to 16: Spring Internet World 2001 in Los Angeles. The exhibition will be from March 14 to 16.

March 13 to 15: DCI Summit on Wireless Computing in Chicago.

March 13 to 16: DATE2001 in Munich, Germany. The exhibition will run from March 13 to 15.

March 13 to 16: 2001 IEEE-VR at the Pacifico Yokohama in Yokohama, Japan.

March 14 to 15: ISMR 2001 in Yokohama, Japan in conjunction with the IEE-VR conference.

March 22 to 24: GDC 2001 at the San Jose Convention Center in San Jose, Calif.

March 21 to 23: CTAM Digital and Pay-Per-View Conference at the Hilton New Orleans Riverside in New Orleans.

March 22 to 28: CeBIT 2001 in Hannover, Germany.

March 25 to 28: PC Forum in Scottsdale, Ariz.

April 2001

April 2 to 5: COMDEX/Spring 2001 in Chicago.
April 2 to 5: Linux Business Expo, concurrent with COMDEX/Spring 2001.
April 3 to 5: Nepcon Electronics UK in Birmingham, England at the National Exhibition Center.
April 4 to 6: ISPCON Spring in Orlando, Fla.
April 4 to 7: COMDEX China 2001 at the China International Exhibition Centre in Beijing.
April 5 to 8: AEF Satellite and Broadcast, a CeBIT event, in Istanbul, Turkey.
April 9 to 13: Seybold Seminars Boston/Publishing 2001 in Boston.
April 10 to 12: COMDEX Asia at Singapore Informatics 2001 in Singapore.
April 21 to 26: NAB 2001 in Las Vegas. Exhibits will be shown Monday to Thursday.
April 23 to 25: Web Advertising conference in New York.
April 29 to May 4: Software Technology Conference at the Salt Palace Convention Center in Salt Lake City.

May 2001

May 2 and 3: Del Mar Electronics Show at the Del Mar Fairgrounds in San Diego, California.
May 12 to 19: ICSE 2001 at the Westin Harbour Castle Hotel in Toronto, Ontario.
May 14 to 17: CardTech/SecurTech conference in Las Vegas. The exhibits will be open May 15 to 17.
May 15 and 16: Nepcon East in Boston at the Bayside Exposition Center.
May 15 to 17: Now, a CeBIT event, in Sydney, Australia.
May 15 to 18: COMDEX Mexico in Mexico City at the World Trade Center.
May 17 to 19: E3 in Los Angeles, Calif.
May 27 to 30: COMDEX Egypt at the Cairo International Conference Centre in Cairo.
May 29 to June 1: COMDEX/INFOCAM Argentina at the La Rural Exposition Center in Buenos Aires.

June, July & August 2001

June 5 to 8: JavaOne Conference at the Moscone Center in San Francisco, Calif.
June 18 to 22: DAC at the Las Vegas Convention Center in Las Vegas, Nev.
June 26 to 28: PC Expo in New York at the Jacob K. Javits Convention Center in New York.
June 26 to 28: PC Career Expo in New York at the Jacob K. Javits Convention Center in New York.
July 10 to 12: Summer Internet World in Chicago, Ill.
July 17 to 20: MACWORLD Conference and Expo/New York 2001 in the Jacob K. Javits Convention Center in New York.
July 22 to 25: CTAM Summit 2001 at the San Francisco Marriott Hotel in San Francisco, Calif.
July 30 to Aug. 3: Web Design World in Seattle, Washington, sponsored by Thunder Lizard Productions.
Aug. 27 to 30: West Coast LinuxWorld in San Francisco, Calif.

September 2001

Sept. 4 to 6: Scandinavian Electronics Fair at the Exporama in Oslo, Norway.
Sept. 5 to 7: NetWorld+Interop, IT 2001/COMDEX in Melbourne, Australia.
Sept. 5 to 8: NAB Radio Show in New Orleans, La.
Sept. 9 to 14: NetWorld+Interop 2001 in Atlanta, Ga.
Sept. 10 to 14: Linux Business Expo in Atlanta, Ga.
Sept. 11 to 14: COMDEX South Africa in Johannesburg.
Sept. 14 to 16: eShow: The Consumer Internet Event at Madison Square Garden in New York.
Sept. 20 to 23: CeBIT Asia in Shanghai, China.
Sept. 24 to 28: Seybold San Francisco 2001 in San Francisco, Calif.

October & November 2001

Oct. 3 to 5: Fall Internet World in New York.
Oct. 15 to18: Technology in Government Week in Ottawa, Canada.
Oct. 16 to 18: ISPCON Fall in Las Vegas.
Oct. 31 to Nov. 3: COMDEX Israel 2001 in Tel Aviv.
Nov. 4 to 8: ICCAD 2001 at the Doubletree Hotel in San Jose, Calif.
Nov. 5 to 7: NAB European Radio Conference in Berlin at the Grand Hyatt.
Nov. 7 to 8: iDevelop 2000 in Austin.
Nov. 12 to 16: COMDEX/Fall 2001 in Las Vegas.

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